21056

NATIONAL LIBRARY
OTTAWA

CANADA

BIBLIOTHÈQUE NATIONALE
OTTAWA

NAME OF AUTHOR...OLEH LUKOMSKYJ...

TITLE OF THESIS...THE RELATIONSHIP BETWEEN...
CHANGE IN HOUSEHOLD STRUCTURE
AND INTRA URBAN MOBILITY...

UNIVERSITY...OF ALBERTA, EDMONTON...

DEGREE FOR WHICH THESIS WAS PRESENTED...MASTER OF ARTS

YEAR THIS DEGREE GRANTED...1974...

Permission is hereby granted to THE NATIONAL LIBRARY OF CANADA to microfilm this thesis and to lend or sell copies of the film.

The author reserves other publication rights, and neither the thesis nor extensive extracts from it may be printed or otherwise reproduced without the author's written permission.

(Signed)...

PERMANENT ADDRESS:

...14386 - PARK DRIVE
...EDMONTON ALBERTA
...

DATED...FEB. 20...1974

NL-91 (10-68)

THE UNIVERSITY OF ALBERTA

THE RELATIONSHIP BETWEEN CHANGE IN HOUSEHOLD STRUCTURE AND INTRA-URBAN MOBILITY

by

Ⓒ OLEH LUKOMSKYJ

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE

STUDIES AND RESEARCH IN PARTIAL FULFILMENT OF THE

REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

DEPARTMENT OF GEOGRAPHY

EDMONTON, ALBERTA

SPRING, 1974

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled THE RELATIONSHIP BETWEEN CHANGE IN HOUSEHOLD STRUCTURE AND INTRA-URBAN MOBILITY submitted by OLEH LUKOMSKYJ in partial fulfilment of the requirements for the degree of Master of Arts.

....

Supervisor

....

John Foster

Date Feb 6, 1974

ABSTRACT

This thesis examines spatial and temporal aspects of intra-urban moves within the City of Edmonton. The sample population consists of 403 households in which a child was born and 326 households in which a person was widowed. The study period is five years, from 1966 to 1971.

The principal purpose of the study is to determine whether or not there exists some relationship between a change in household structure and intra-urban mobility. This study also examines the nature of the intra-urban moves in terms of mobility rates, spatial patterns, and spatial biases. Data for the study were obtained from past issues of the Edmonton Journal and Henderson's Edmonton Directories for the years 1966 to 1971. A short questionnaire was mailed to those households in which a child was born.

The study shows that a change in household structure is related to temporal variations in mobility rates. Both sample populations had their highest rates of mobility immediately after the change in household structure. It is also evident from this study that different residential patterns and spatial biases in moves are associated with different household structures.

During the course of researching this topic it became clear that there exists a lack of systematic emperical research within the specific thesis topic. The last chapter, therefore, suggests a framework for future research at the micro-, meso-, and macro-levels.

ACKNOWLEDGEMENTS

A great number of persons contributed directly and indirectly to the completion of this thesis. An imperfect memory prevents me from listing all their names but, this in no way detracts from the value of their contributions.

Special thanks go to my supervisor, Dr. K. J. Fairbairn, for his constant guidance and ecouragement during my years as a graduate student. I also thank Dr. Johnson and Dr. Forster for their participation as members of my examining committee. Others to whom thanks are due include my typists Elaine Henderson and Angela Keys, staff and faculty of the Geography Department, and those persons whose friendship was especially appreciated, Chas, Harry, Karl, Kevin, Larry, Mary, Mike, Paul, and Uberta.

TABLE OF CONTENTS

CHAPTER		PAGE
I	STUDY OUTLINE	1
	Place Utility	2
	Family Life Cycle	2
	Research Problem	3
	Study Sample	5
	Data	6
	Limitations of the Study	11
	Presentation	12
II	TEMPORAL VARIATION OF MOBILITY RATES	14
	Review	14
	Analysis	16
	Households - Child-bearing	16
	Households - Widowed	19
	Interpretation	23
	Households - Child-bearing	23
	Households - Widowed	24
	Summary	25
III	AREAL VARIATION OF MOBILITY RATES	27
	Review	27
	Analysis	29
	Households - Child-bearing	29
	Households - Widowed	32
	Interpretation	32
	Households - Widowed	35
	Households - Child-bearing	36
	Summary	38
IV	SPATIAL PATTERNS OF ORIGINS	39
	Review	39
	Analysis	42
	Households - Child-bearing	42
	Households - Widowed	52
	Interpretation	61
	Households - Child-bearing	61
	Households - Widowed	63

CHAPTER PAGE

- V SPATIAL BIASES OF MOVES 66
  - DISTANCE BIAS 68
    - Review 68
    - Analysis 71
      - Households - Child-bearing 71
      - Households - Widowed 71
    - Interpretation 71
      - Households - Child-bearing 71
      - Households - Widowed 77
  - DIRECTIONAL BIAS 80
    - Review 80
    - Analysis 82
      - Households - Child-bearing 82
      - Households - Widowed 85
    - Interpretation 85
      - Households - Child-bearing 85
      - Households - Widowed 86
  - SECTORAL BIAS 89
    - Review 89
    - Analysis - Angle at CBD 90
      - Households - Child-bearing 90
      - Households - Widowed 91
    - Analysis - Angle at Origin 91
      - Households - Child-bearing 94
      - Households - Widowed 94
    - Interpretation 97
      - Households - Child-bearing 97
      - Households - Widowed 98
- VI SPATIAL PATTERNS OF DESTINATIONS 100
  - Analysis 100
    - Households - Child-bearing 100
    - Households - Widowed 102
  - Interpretation 106
    - Households - Child-bearing 106
    - Households - Widowed 109
- VII LIFE CYCLE, PLACE UTILITY, AND INTRA-URBAN MOBILITY 110
  - Household Structure and Mobility Rates 110
  - Household Structure and Mobility Patterns 112
  - Framework for Future Research 115
- BIBLIOGRAPHY 123
- APPENDIX 1 131

LIST OF TABLES

Table	Description	Page
1	Mobility Rates 1966-1971 Households - Child-bearing	17
2	Annual Mobility Rates 1966-1971 Households - Child-bearing	17
3	Mobility Rates 1966-1971 Households - Widowed	21
4	Annual Mobility Rates 1966-1971 Households - Widowed	21
5	Concentric and Sectoral Variation of Mobility Rates Households - Child-bearing	30
6	Concentric and Sectoral Variation of Mobility Rates Households - Widowed	33
7	Concentric Variation of Selected Census Varaibles Edmonton (1961)	41
8	Location of Origins by Distance from the P.V.I. Households - Child-bearing	43
9	Location of Origins by Angle of Origin Households - Child-bearing	47
10	Location of Origins by Distance from the P.V.I. Households - Widowed	53
11	Location of Origins by Angle of Origin Households - Widowed	56
12	Length of move Households - Child-bearing and Widowed	73
13	Move Lengths Aggregate Edmonton Population (1971) and for Households Child-bearing and Widowed	75

14 Change in Distance from the P.V.I. (Dd-Do) Households - Child-bearing and Widowed 84

15 Absolute Change in Angle at the P.V.I. Households - Child-bearing and Widowed 93

16 Angle of Move at Origin Households - Child-bearing and Widowed 96

17 Location of Destinations by Distance from the P.V.I. Households - Child-bearing and Widowed 101

18 Location of Destinations by Angle of Destination Households - Child-bearing and Widowed 104

LIST OF FIGURES

Figure	Description	Page
1	Methods of Measuring Moves	8
2	Measurement of Moves	10
3	Annual Mobility Rates Households - Child-bearing	20
4	Annual Mobility Rates Households - Widowed	22
5	Origins(1966) Households - Child-bearing Total Sample	31
6	Origins(1966) Households - Widowed Total Sample	34
7	Distribution of Origins by Distance from the P.V.I. Households - Child-bearing Total Sample	44
8	Distribution of Origins by Distance from the P.V.I. Households - Child-bearing Leaving the City	44
9	Distribution of Origins by Distance from the P.V.I. Households - Child-bearing Intra-urban Movers	45
10	Distribution of Origins by Distance from the P.V.I. Households - Child-bearing Non-movers	45
11	Origins(1966) Households - Child-bearing Non-movers	49
12	Origins(1966) Households - Child-bearing Leaving the City	50
13	Origins(1966) Households - Child-bearing Intra-urban Movers	51

14 Distribution of Origins by Distance from the P.V.I. Households - Widowed Total Sample 54

15 Distribution of Origins by Distance from the P.V.I. Households - Widowed Leaving the City 54

16 Distribution of Origins by Distance from the P.V.I. Households - Widowed Intra-urban Movers 55

17 Distribution of Origins by Distance from the P.V.I. Households - Widowed Non-movers 55

18 Origins(1966) Households - Widowed Non-movers 58

19 Origins(1966) Households - Widowed Leaving the City 59

20 Origins(1966) Households - Widowed Intra-urban Movers 60

21 Variables Defining Location of Destination 67

22 Length of Move Households - Child-bearing 71

23 Length of Move Households - Widowed 71

24 Change in Distance from P.V.I. Households - Child-bearing 83

25 Change in Distance from P.V.I. Households - Widowed 83

26 Angle of Move at P.V.I. Households - Child-bearing 92

27 Angle of Move at P.V.I. Households - Widowed 92

28 Angle of Move at Origin Households - Child-bearing 95

29 Angle of Move at Origin Households - Widowed 95

30 Distribution of Destinations by Distance from the P.V.I. Households - Child-bearing 102

31 First Destinations Households - Child-bearing Intra-urban Movers 105

32 Distribution of Destinations by Distance from the P.V.I. Households - Widowed 107

33 First Destinations Households - Widowed Intra-urban Movers 108

34 Areal Limits of Move Destinations 114

CHAPTER I

STUDY OUTLINE

This thesis deals with the relationship between household structure, residential requirements, and residential mobility. The general area of study is mobility which may be defined as the movement of persons from one place to another. More specifically, this thesis deals with residential mobility which is defined as the movement of a household from one residence to another. Residential mobility has also been defined as "... an act of overt behavior, an adjustment process by which a household physically changes its living quarters ..." (Golant, 1972, p. 69). Residential mobility is clearly a spatial phenomenon since movement from one residence to another involves both distance and direction. In this study, residential mobility is treated as a spatial phenomenon and an adjustment process, in synthesis. That is, in this study residential mobility is defined as a spatial adjustment.

Adjustments are made with reference to something. In this study, the spatial adjustment (residential mobility) is viewed as an adjustment to changed residential requirements. However, not all residential requirements are considered, only those which are influenced by household structure. Thus, this study deals with residential mobility as a spatial adjustment to changed residential requirements as influenced by changed household structure. In the literature, residential requirements and household structure are associated with place utility and the family life cycle.

Place Utility

The concept of place utility is defined as the "... net composite of utilities which are derived from an individual's integration at some position in space ." (Wolpert, 1965, p. 162). Place utility "... essentially measures an individual's level of satisfaction or dissatisfaction with respect to a given location." (Brown and Moore, 1970, p. 201). A level of dissatisfaction may be interpreted as place disutility. The utility of a place for an individual may be considered as being indicative of the attractiveness of that place relative to other places, for the individual. Thus the concept may be used as a method of areal differentiation, evaluating one location relative to another in terms of place utility for an individual or group. In this case it is assumed that a move terminates in a location of greater place utility than was experienced at the origin (Brown and Moore, 1970, p. 201).

Family Life Cycle

The family life cycle is a term used to describe the various stages through which a family goes, from formation to dissolution. Usually seven stages are included; formation (marriage), pre-child, child-bearing, child-rearing, child-launching, post-child, and dissolution (widowhood, divorce). Of course, not all families go through all seven stages. Some couples remain childless and for some, the seventh stage may preceed others due to death or divorce.

The family life cycle has frequently been used to differentiate mobility rates and spatial bias of moves. Also, the progression to some stages has been identified as a causal factor of mobility.

Rossi's (1955) general statement that mobility is a response to changing housing needs as effected by life cycle changes has been supported in later studies. The relationship of mobility and the family life cycle is outlined by Moore.

> The correlation between stage in the life cycle and mobility is to be understood primarily in terms of the effect of changing needs with respect to dwelling space and neighborhood characteristics as the structure of the family changes. (Moore, 1972, p. 11)

This statement expresses the essential elements of this study's research problem; family structure, residential requirements, and residential mobility.

Research Problem

The research problem of this study is to test the hypothesis that family structure has an influence on residential mobility in both spatial and temporal terms. Since moves are generally made to improve place utility it follows that mobility is some function of residential requirements. For example, if a new single-family dwelling is the residential requirement of a household then this household's move will be restricted to those areas where such housing is available. Since most single-family houses are built in the outer areas of the city, the move is likely to be to these areas. Thus an aspatial residential requirement influences the spatial nature of a move, specifically its direction.

Furthermore, there is a relationship between family structure and residential requirements. At various stages of the life cycle residential requirements will differ due to the specific requirements of the household members. For example, young children, single adults, and retired persons have different activities and different activity spaces. A child's activity space is limited to the immediate neighborhood, single adults may desire proximity to work, whereas retired persons may want proximity to community facilities or friends. Since residential requirements are a function of household structure and mobility is some function of residential requirements, it follows that family structure is of impact in the process of residential mobility. More precisely, household structure influences residential requirements which, in turn, influence residential mobility. By selecting households of a specific structure and examining some aspects of the spatial nature of their moves, this study intends to demonstrate that certain patterns of moves are associated with a particular household structure and that the observed patterns can be interpreted as being influenced by the requirements of the sample households. Selected aspects of mobility are analyzed, described and interpreted with reference to household structure and requirements.

The aspects of mobility which have been selected for analysis are:

1. temporal and areal variations of mobility rates;
2. location of origins and destinations;
3. spatial bias of direction, distance, and sectorality.

In order to test the hypothesis that different household structures influence different patterns of movement two household types have been selected. One sample consists of households in the child-bearing stage and the other consists of households in the widowhood stage. The study area is the City of Edmonton. In order to facilitate the collection of data and simplify the subsequent descriptions and explanations, only those moves which occurred within the City of Edmonton are considered. That is, intra-urban residential mobility is the subject of this study.

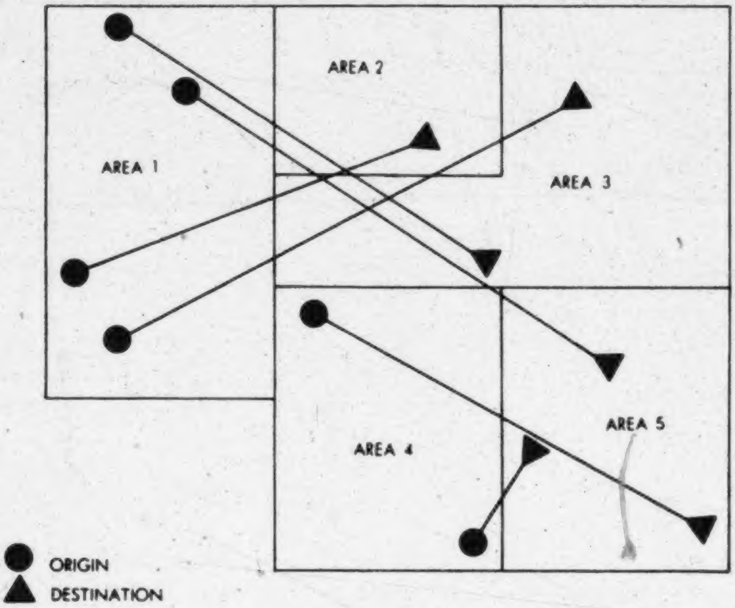
Although the data are from Edmonton, the principal purpose of this study is to examine the relationship of family structure and mobility patterns and not one of describing the patterns of mobility in Edmonton per se. However, since the data are from Edmonton the study does provide information on the unique case. A further aspect of this study is the methodological approach adopted. Much previous intra-urban literature has been aggregative in nature and conclusions have been mostly general. As was noted by Simmons and Baker (1972, p. 50), "It is almost impossible to generalize about migration patterns because of the divergence of the disaggregate pattern. By changing the sample mix quite different results emerge. The complexity of the patterns emerges repeatedly." This study deals with two specific sub-populations selected on the basis of family structure and is not concerned with aggregate population mobility. In this way it is intended to overcome the problem noted by Simmons and Baker.

Study Sample

The study sample consists of 729 names representing households which had an Edmonton address in 1966. Of these, 403 are households in which a child was born and 326 are households in which a person was widowed. The births and deaths all occurred within the first six months of 1966. The 403 births of the child-bearing group represent between nine and ten per cent of all births in Edmonton for the first half of 1966. The widowed persons represent sixty-three per cent of all persons widowed in Edmonton for the same period. The names were taken from the birth and death announcements of the Edmonton Journal from January to June, 1966. Henderson's Edmonton Directories were then used to determine each household's Edmonton address for the years, 1966 to 1971. Those households which had the same address for all years were classed as non-movers, those that made at least one intra-urban move within the study period were classed as intra-urban movers, and those who did not make an intra-urban move and did not have an Edmonton address for all years were classed as left the city. Some moves may have been made before 1966 in anticipation of the event but, they were not considered for the following reasons. It is virtually impossible, without a personal interview, to determine that a move was in anticipation of the subsequent event. Equally as difficult is the question of the anticipatory non-mover. Did those households which decided to remain do so in anticipation of the expected event? Dealing with, and finding answers to such questions is beyond the scope of this thesis and moves prior to the event were not considered.

Data

The basic data consisted of addresses. These were plotted on a street map of Edmonton and the following measurements were recorded. For all households the 1966 origin was described in terms of a concentric and an angular coordinate and similar measures were taken for intra-urban moves. The year of the intra-urban moves was also recorded. For those households leaving the city the first year of non-residence in the city was recorded. The concentric-sectoral grid used to describe all origins and destinations was composed of one degree sectors and concentric circles at intervals representing about one hundred and seventy feet, both centered on the intersection of 101st Street and 101st Avenue. Each location was assigned a distance from this intersection and an angular coordinate, 00 degrees representing west of the intersection with increasing value of angles in a clockwise direction. The grid was selected for three reasons. Previous studies suggest that concentric and sectoral structure is basic in residential morphology (Berry, 1965 pp. 100 - 101). Other studies similar to this one have used these measures so they were employed to facilitate comparison of results. It is suggested that the method used is superior to an area to area analysis, such as census division to census division, since the latter method tends to obscure some of the spatial bias in moves. Moves from one area to another may vary in terms of distance and direction but, sometimes this cannot be determined in an area to area analysis as illustrated in Figure 1. Two moves, originating in area one and terminating in area three, differ in their directional bias yet would be classed as similar by an area to area analysis. Furthermore, the moves originating in area one and terminating in areas two and five, although each is similar to a move from area one to area three in terms of distance and direction, would be placed in different groups. Although the moves from area four to area five are very different in terms of distance and direction, they would be grouped into one class in an area to area analysis (Figure 1). For the purposes of identifying spatial biases it is necessary to determine the length and



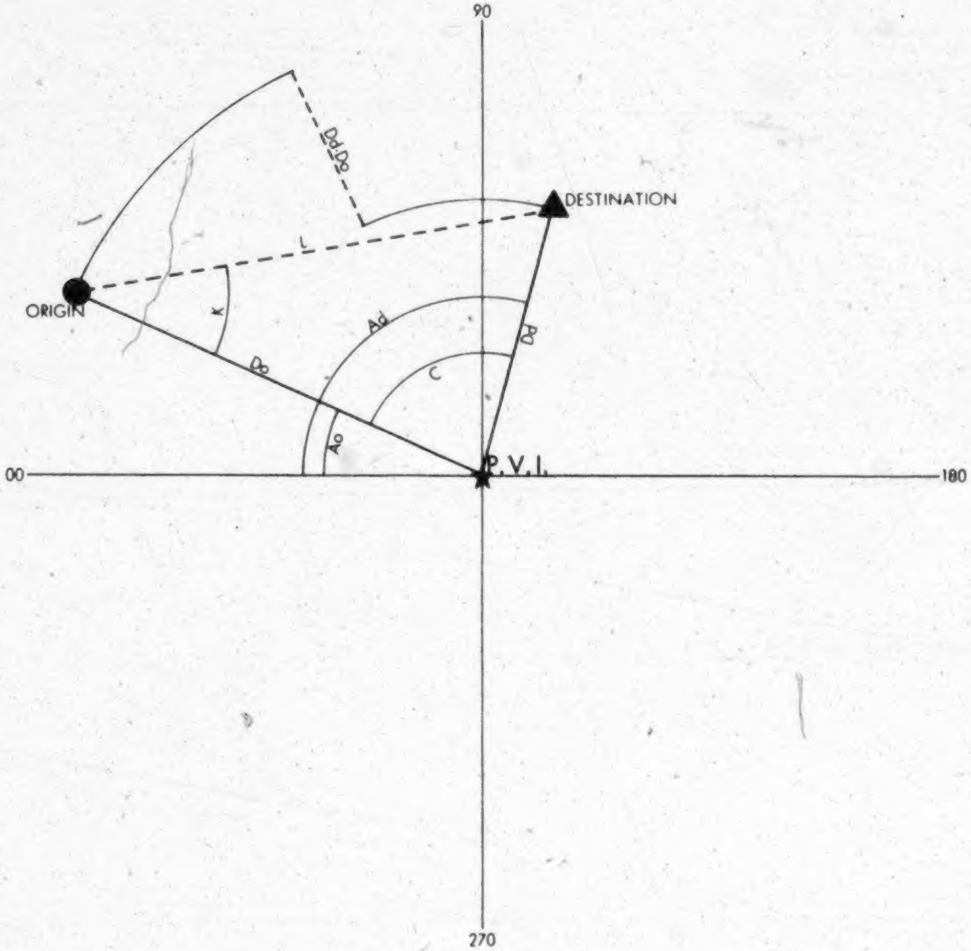
METHODS OF MEASURING MOVES

Figure 1

direction of intra-urban moves. Since an area to area analysis tends to obscure some of these biases it is not the most accurate method. In this study the length and direction of move are measured using the exact location of origin and destination. Further measurements, derived from the coordinates of origins and destinations, were recorded for intra-urban moves. These were, length of move (straight line distance), change in distance from the PVI, and change in angle at the PVI and angle at the origin.

In summary, the data consists of distance from the peak value intersection and angular coordinate for all origins (Do and Ao), similar measures for first destinations of intra-urban movers (Dd and Ad), length of intra-urban move (L), change in distance from the peak value intersection from origin to destination (Dd-Do), change in angle at the peak value intersection from origin to destination (C), and angle of move at the origin (K), (Figure 2). The first year in which those leaving the city and intra-urban movers were not at their original address was also recorded. The data collected are taken to represent two variables, residential characteristics at either origin or destination, and change in residential characteristics as effected by an intra-urban move. It is assumed in this study that these two variables reflect residential requirements and change in residential requirements respectively. Those measurements associated with residential requirements are; Do, Ao, Dd, Ad. Those associated with change in residential requirements are; L, Dd-Do, C, K, and year of move (Y).

In addition to describing locations in terms of specific



MEASUREMENT OF MOVES

Figure 2

distance and angular coordinates, use is made of more general terms. The terms inner, middle, and outer are used in this thesis with reference to areas within approximately two miles, two to four miles, and more than four miles from the PVI, respectively. Some angular coordinates are described in terms of general compass direction, north-west for example. In these cases the pattern or distribution being described did not conform to the ten degree intervals used. A general description supplemented with maps and tables was considered sufficient. Additional data were collected via a mailed questionnaire sent to those households in the original sample that could be located in Edmonton. Five questions were asked. One was open-ended and four were closed. The four closed questions determined year of move, type, tenure, and relative size of dwelling at origin and destination. The open-ended question asked the respondent to list reasons for move (Appendix 1).

Limitations of the Study

The major limitations of the study are as follows. Most of the conclusions and interpretations must be implied from data analysis since a comprehensive questionnaire was not administered to the sample of intra-urban migrants. This was not done for two reasons. Firstly, many of the migrants could not be located since the base year for the study was 1966 and many had moved out of the city. For example, of the one hundred and forty-three child-bearing households only about ninety could be located in city directories for 1973. Secondly, the reliability of an evaluation of two residences four or five years after a move is subject to question because the residents will have forgotten a great deal about their perception of and attitude to the old and new homes at the time of move. This study is further limited by the lack of comparable empirical studies. Because of this it was necessary to evaluate this study's analysis of data by referring to assumptions made within this study and by citing assumptions and conclusions of other studies. This tends to limit the interpretation and conclusiveness of the explanations. Therefore this study should be viewed more as one which provides an initial directive for on-going research employing a micro-level approach as used in this study. The usefulness of this approach is judged by comparing data interpretation of this study to that of other studies. For this reason previous studies are often mentioned as being in agreement with this study's interpretations.

Presentation

This thesis consists of three parts. The first deals with mobility rates in both a temporal and spatial context (Chapters two and three). The second part consists of three chapters which deal with the location of origins (Chapter four), spatial biases of moves (Chapter five), and the location of destinations (Chapter six). Chapters two through six are organized in the following manner. Following an introductory review the data is analyzed and then interpreted. In Chapter five, three spatial components of mobility patterns are discussed; distance, directional, and sectoral biases. Each is dealt with in the manner as described in this section. The last part consists of a general summary and concluding statement about the study and a comment on some future avenues of research in intra-urban mobility as indicated by the results of this study (Chapter seven).

CHAPTER II

TEMPORAL VARIATION OF MOBILITY RATES

Mobility rates represent the proportion of a population that has relocated. By examining the variation of mobility over a period of time it may be determined whether there is a greater propensity to move at one time rather than another, for a particular sub-population. If there can be identified periods of higher rates of mobility some insight may be gained with respect to factors of impact in residential mobility by examining the characteristics of the population at times of high mobility. As a corollary, the population characteristics in times of low mobility rates provide information with respect to factors influencing low mobility. Thus, by adopting a longitudinal approach, where mobility rates and population characteristics are examined over a period of time, there can be isolated relationships between population characteristics and mobility. This provides a directive as to relevant variables in the study of mobility. This chapter includes a review of some relevant literature, analysis of this study's data, and an interpretation of the data in light of the literature.

Review

Rossi's Philadelphia study was instrumental in generating interest in the relationship between intra-urban mobility and the family life cycle. "The findings of this study indicate the major function of mobility to be the process by which families adjust their housing to the housing needs that are generated by the shifts in family composition that accompany life cycle changes." (Rossi, 1955, p. 9). Specifically, Rossi stated that mobility in the family formation and child-bearing stages was high and declined in subsequent stages (Rossi, 1955, p. 178). Two years later an analysis of United States census data by Glick generated a similar conclusion. He states "The proportion of families that move within a given year is relatively high among those with a young head and declines as the age of the head advances." (Glick, 1957, p. 89). The concept of a relationship between mobility and stage in family life cycle was incorporated in a model developed by Abu Lughod and Foley (Foote et al, 1960, p.99). High rates of mobility were ascribed to families in the child-bearing stage and the lowest in the post-child stage. Another model, with stage in family life cycle an independent variable affecting residential mobility was proposed by Leslie and Richardson (1961). The finding of these and other studies up to 1968 prompted Simmons to state in his review article of intra-urban mobility, "The major factor causing differential mobility rates is the life cycle ..." (Simmons, 1968, p. 397). This statement was also a conclusion of Simmons' own study in which mobility in the United States was analyzed by age groups. It was found that intra-county mobility rates for children under five were high, declined to the ages of fifteen to seventeen, peaked at over thirty per cent for persons in the early twenties, declined to about age fifty and then remained relatively constant (Simmons, 1968, p. 397). Subsequent analyses of intra-metropolitan mobility by age generated similar results; Simmons' (1971) and Hill's (1971) studies for Toronto and Moore's (1972) study for the United

States. These studies, however, provide only a general indication of trends in mobility rates due to the aggregative nature of the data used. Also, their findings may not be entirely applicable for life cycle groups since age is used as a surrogate. The data in this study allows a more detailed analysis of mobility rates for two life cycle groups. The interpretation of the following analysis will be at the micro-scale. Two models of relative intra-urban mobility rates, independent of age but dependent on stage in life cycle, are developed later in this chapter. These models describe the micro-patterns of intra-urban mobility rates for a five year period following the birth of a child or the death of a spouse in a household. The analysis of data, which forms the basis of these models, is described in the following section.

Analysis

Households - Child-bearing

The aggregate (five year) mobility rate for child-bearing households was fifty-two per cent with fourteen per cent of the households leaving the city and thirty-seven per cent making at least one intra-urban move. The remaining forty-eight per cent were at the same residence throughout the five year period (Table 1). These figures are comparable to those of other studies where it has been found that about one-half of a population relocates within five years. About two-thirds of these relocations are intra-urban moves and the remaining one-third, inter-urban, urban-rural, rural-urban or rural-rural (Simmons, 1968; Moore, 1972). On an annual basis, however, total mobility rates varied considerably. The five annual values may

Table 1

MOBILITY RATES 1966 - 1971
HOUSEHOLDS - CHILD-BEARING

		Per cent of Sub-total
Total Sample	403	
Deaths (estimated)	21	
Sub-total	382	100.0
Non-movers	184	48.2
Intra-urban movers	143	37.4
Left the city	55	14.4

Source: Henderson's Directories and the Edmonton Journal

Table 2

ANNUAL MOBILITY RATES 1966 - 1971
HOUSEHOLDS - CHILD-BEARING

YEAR	1966 1967	1967 1968	1968 1969	1969 1970	1970 1971
TOTAL SAMPLE	403	323	254	224	197
Deaths (estimated)	6	5	4	3	3
Sub-total	397	318	250	221	194
Non-movers	323	254	224	197	184
% of sub-total	81.4	79.9	89.6	89.2	94.8
Intra-urban movers	48	54	20	16	5
% of sub-total	12.1	17.0	8.0	7.2	2.6
Left the city	26	10	6	8	5
% of sub-total	6.5	3.1	2.4	3.6	2.6

Source: Henderson's Directories and the Edmonton Journal

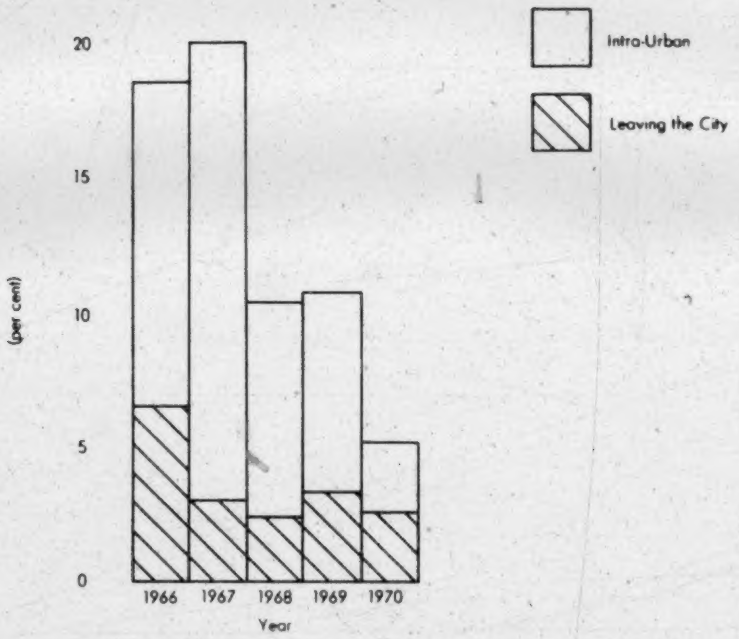
be grouped into three general classes of high, medium, and low mobility. The first two years have similar rates of mobility (nineteen and twenty per cent) and form the high class. The third and fourth years form the medium class (ten and eleven per cent) and the last year (five per cent) is in the low class (Table 2). The observed pattern in mobility rates suggests that during the five year period, and more specifically between the second and third, and fourth and fifth years there occurred some change in the population sample that influenced a decreasing residential mobility. This will be reviewed in the next section.

In disaggregate form, annual mobility rates and trends are different for intra-urban movers and those leaving the city. Those leaving the city did so at a fairly even rate except for the first year when the rate of six and one-half per cent was almost twice the mean rate of three and one-half per cent. The latter four years varied between two and one-half and three and one-half per cent with no decreasing or increasing trend indicated (Table 2). Annual intra-urban mobility rates were more varied. The range was fourteen per cent between the high value of seventeen per cent in the second year and the low value of three per cent in the fifth year. The second year peak was about five per cent greater than the first year rate and more than twice the third year rate. There was only a slight decline from the third to fourth years when the rate decreased from eight to seven per cent (Table 2). The major declines were at the same times as those in the aggregate pattern, from the second to third and from the fourth to fifth years. A major increase from the first to second year was characteristic only of the intra-urban rates since in the aggregate pattern it was balanced by a comparable decrease in rates for those leaving the city (Figure 3).

Households - Widowed

The five year total mobility rate for widowed households was forty-two per cent with thirty-two per cent moving within the city and ten per cent leaving the city. Those that remained at their 1966 residence throughout the study period accounted for fifty-eight per cent of the total sample (Table 3). The five year rate of mobility for widowed households was only slightly lower than that of the child-bearing households and that of aggregate studies as mentioned previously.

As in the child-bearing group, the total mobility rates of widowed households varied considerably on an annual basis. The range was fifteen per cent, from a high of eighteen per cent in the first year and three per cent in the fifth year. In the second year the mobility rate of eight per cent was less than half of the first year's rate. In the third and fourth years the rates declined to less than eight and six per cent, respectively. As mentioned, in the fifth year the rate was lowest at three per cent (Table 4). The time-decay nature of annual mobility rates for widowed persons indicates that changes due to widowhood are of impact in increasing rates of mobility. Since more than three-fourths of the relocations were intra-urban, their pattern dominates the aggregate annual pattern (Figure 4). From a high rate of twelve per cent in the first year intra-urban moves declined to intermediate values of seven, six, and six per cent in the second, third and fourth years, respectively. In the last year the



ANNUAL MOBILITY RATES

HOUSEHOLDS – CHILD-BEARING

Figure 3

SOURCE: HENDERSON'S DIRECTORIES
AND THE EDMONTON JOURNAL

Table 3

MOBILITY RATES 1966 - 1971
HOUSEHOLDS - WIDOWED

		Per cent of Sub-total
Total Sample	326	
Deaths (estimated)	69	
Sub-total	257	100.0
Non-movers	150	58.4
Intra-urban movers	82	31.9
Left the city	25	9.7

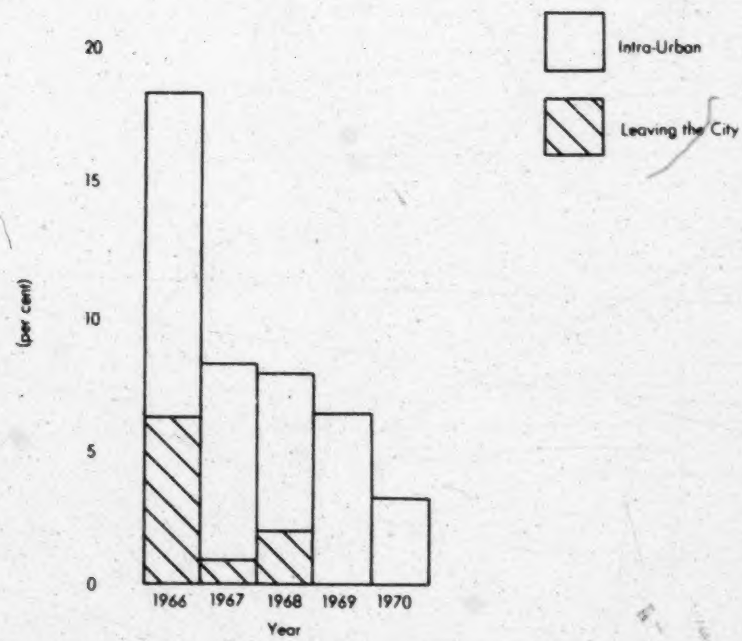
Source: Henderson's Directories and the Edmonton Journal

Table 4

ANNUAL MOBILITY RATES 1966 - 1971
HOUSEHOLDS - WIDOWED

YEAR	1966 1967	1967 1968	1968 1969	1969 1970	1970 1971
TOTAL SAMPLE	326	250	215	186	163
Deaths (estimated)	20	16	13	12	8
Sub-total	306	234	202	174	155
Non-movers	250	215	186	163	150
% of sub-total	81.7	91.8	92.1	93.7	96.8
Intra-urban movers	37	17	12	11	5
% of sub-total	12.1	7.3	5.9	6.3	3.2
Left the city	19	2	4	0	0
% of sub-total	6.2	0.9	2.0	0	0

Source: Henderson's Directories and the Edmonton Journal



ANNUAL MOBILITY RATES

HOUSEHOLDS – WIDOWED

Figure 4

SOURCE: HENDERSON'S DIRECTORIES AND THE EDMONTON JOURNAL

rate of three per cent was lowest. Those that left the city did so primarily in the first year. Of this group, nineteen occurred in the first year, two in the second, four in the third, and none in the last two years. The respective rates were; six, one, two, zero, and zero per cent (Table 4).

Interpretation

Households - Child-bearing

For the five year study period mobility rates of households in the child-bearing stage exhibit three major characteristics. A rapid decline from the second to the third year was followed by another decline from the fourth to the fifth year. This caused a general time-decay trend as presented in the analysis (Figure 3). Most households in the child-bearing stage are composed of adults in the late twenties or older and children up to the age of ten years (Glick, 1957; Foote et al, 1960). As has been shown in previous analyses, the mobility rates of these two sub-populations tend to decline in time (Simmons, 1968; Moore, 1972). The study sample, therefore, exhibits a trend which is in accord with the findings of previous studies.

Declining mobility rates of households in the child-bearing stage are a result of two general trends, increased mobility in the early stages and decreased mobility in the later stages. Increased mobility is influenced by the need for more dwelling space as caused by increasing family size. This fact is evident in the results of the questionnaire survey where about fifty per cent of the respondent households stated that their reason for moving was an increase in family size or inadequate dwelling space. This is further supported by the fact that thirty-one of the thirty-seven respondents moved into dwellings larger than their previous dwelling (Appendix 1). The birth of a child places a strain on the dwelling's space in the initial years. The need for additional space in the first year is perhaps partially an anticipated need since only after the child becomes physically mobile, about one year later, does the need become actual. This provides an explanation of the nearly equal rates of high mobility in the first two years.

Decreased mobility in the later stages of the child-bearing period is influenced by two factors. Since most moves to larger and/or owned dwellings have been made in the initial years of high mobility it follows that fewer households will relocate later. Secondly, after four or five years the child is about to enter school and there may be other children, born earlier, already attending school. The fact that the children have established neighborhood contacts through school, community and friends, tends to stabilize the family at its location (Foote et al, 1960). The trend to lower mobility rates as children approach school age is evident in previous analyses of mobility (Simmons, 1968 ;Moore, 1972) and is similarly evident in this study's analysis (Figure 3).

Households - Widowed

With the exception of one recent study (Golant, 1972), there is a lack of literature dealing with the mobility of widowed persons and the widowed in general (Berardo, 1968 ; 1970). Simmons (1968) briefly mentions that death or illness may generate a move and Adams

(1969) states, equally briefly, that some drastic financial or domestic reverse such as death, divorce, bankruptcy, and so forth, may generate a relocation.

The death of a spouse influences a number of situations which may cause the widowed person to consider residential relocation. The financial and physical requirements for maintenance of a large and/or owned dwelling may exceed the capabilities of the widowed person. In many cases, the death of a husband brings severe economic problems for the widow as a result of the loss of primary income. An owned home may be sold in order to utilize the equity. The loss of a spouse can bring problems of intense loneliness and a move closer to friends or relatives may be initiated. A decrease in daily mobility may generate a move nearer to public transport or frequent destinations such as a church or hospital. The stress experienced by the widowed person occurs soon after the death and it may be expected for moves to be most frequent after this. After the death of a spouse, it may be expected that mobility would decline in time. That is, widowed persons who did not move soon after the death can be expected to have adjusted in situ to meet the new conditions as brought about by widowhood. The analysis of data in this study indicates that this is the case. The rapid decline of mobility rates soon after widowhood suggests that if the widowed person is to make a move it is most likely to occur shortly after the death of a spouse.

Summary

Both sample populations exhibit a marked decline in mobility over the five year study period. In each case, high rates of mobility occurred shortly after a change in household structure. As was pointed out earlier in this chapter, a change in household structure is a factor in causing residential relocations. From the analysis of data it may be concluded that there exists a relationship between change in household structure and an increased propensity to move.

CHAPTER III

AREAL VARIATION OF MOBILITY RATES

The spatial pattern of mobility indicates where there exists a greater or lesser propensity to move. Areas of higher or lower mobility for similar households suggest that area characteristics in some way influence mobility rates. This may be related to the concept of place utility. For a specific type of household it may be expected that place utility will vary from area to area. Since it may also be anticipated that moves are more likely to originate in areas of low, rather than high place utility for some group, areal variation in mobility may be interpreted as indicating relative place utilities for that population. By identifying the areal variation of mobility for a sub-population some insight may be gained as to the impact of locational factors on the propensity to move. This chapter presents some findings of previous studies with respect to areal variation of mobility. Subsequently, this study's data are analyzed and interpreted in the light of existing theory.

Review

In general, intra-urban mobility declines with increasing distance from the CBD. This was shown empirically for Toronto (Simmons, 1968, p. 398) and Brisbane (Moore, 1972, p. 29). The observed pattern can be interpreted in terms of the spatial variation of certain variables which are associated with differential rates of mobility. Two such variables are, stage in life cycle and tenure.

As was reviewed in a previous section, certain rates of mobility are characteristic of sub-populations defined in terms of stage in life cycle. It follows that the spatial distribution of these variables will influence the spatial distribution of mobility. It has frequently been shown in the literature that inner areas are dominated by persons in their late teens and early twenties and that outer areas have a large proportion of children less than fifteen years old and adults between the ages of thirty-five and forty-five. The corresponding life cycle stages for the inner areas are pre-marriage and pre-child. For the outer areas, the stages are those of child-bearing and child-rearing. This type of relationship can be found in Rossi's (1955) and Abu Lughod and Foley's (Foote et al, 1960) studies and was demonstrated empirically for Melbourne by Johnston (1971), for Brisbane by Moore (1972), and for Edmonton by McVey (1971). Rates of mobility are high for single persons and those eighteen to twenty-five years of age, which suggests high rates of mobility in inner areas of a city. Conversely, children less than fifteen years old and married persons over the age of thirty-five have low rates of mobility, which implies low rates in outer areas.

A number of studies have shown that tenure is of importance in determining mobility rates, renters, as a group, being more mobile than owners (Rossi, 1955, p. 69; Simmons, 1968, p. 397; Boyce, 1969, p. 340; Moore, 1972, p. 9 - 10). In general tenure varies concentrically, with the incidence of ownership decreasing towards the city centre (Berry, 1955, p. 101). This pattern was shown in an empirical analysis of data for Melbourne (Johnston, 1971), Brisbane (Moore, 1972) and Edmonton (McVey, 1971). From this it may be assumed that mobility rates, as influenced by tenure status, would increase towards the CBD. Other factors which may influence mobility rates include conversion and redevelopment to higher densities or non-residential use. These processes occur outward from around the CBD (McCann, 1972), and reinforce the trend influenced by the life cycle and tenure. Further reference to these and other factors will be made in the following discussion of the spatial variation of mobility for two specific stages in the life cycle.

Analysis

Households - Child-bearing

The city can be divided into three broad sectors representing areas of high, average, and low rates of mobility relative to the mobility of the total sample. The most stable area was in the north-east where forty-seven per cent of the households had relocated by 1971. Least stable was an area in the north-west where sixty-three per cent of the households relocated by 1971. The southern portion of the city had an average rate of mobility, with fifty-six per cent of the households remaining compared with fifty-four per cent for the total sample (Table 5).

With respect to distance from the CBD, there was an inverse relationship between mobility and location. The most evident change in mobility occurred at two and one-third miles from the CBD. More than eighty per cent of the sample households within this distance were movers whereas they accounted for fifty-four per cent of the total sample. Only three, one-third mile zones beyond two and one-third miles from the CBD had more than the average per centage of movers.

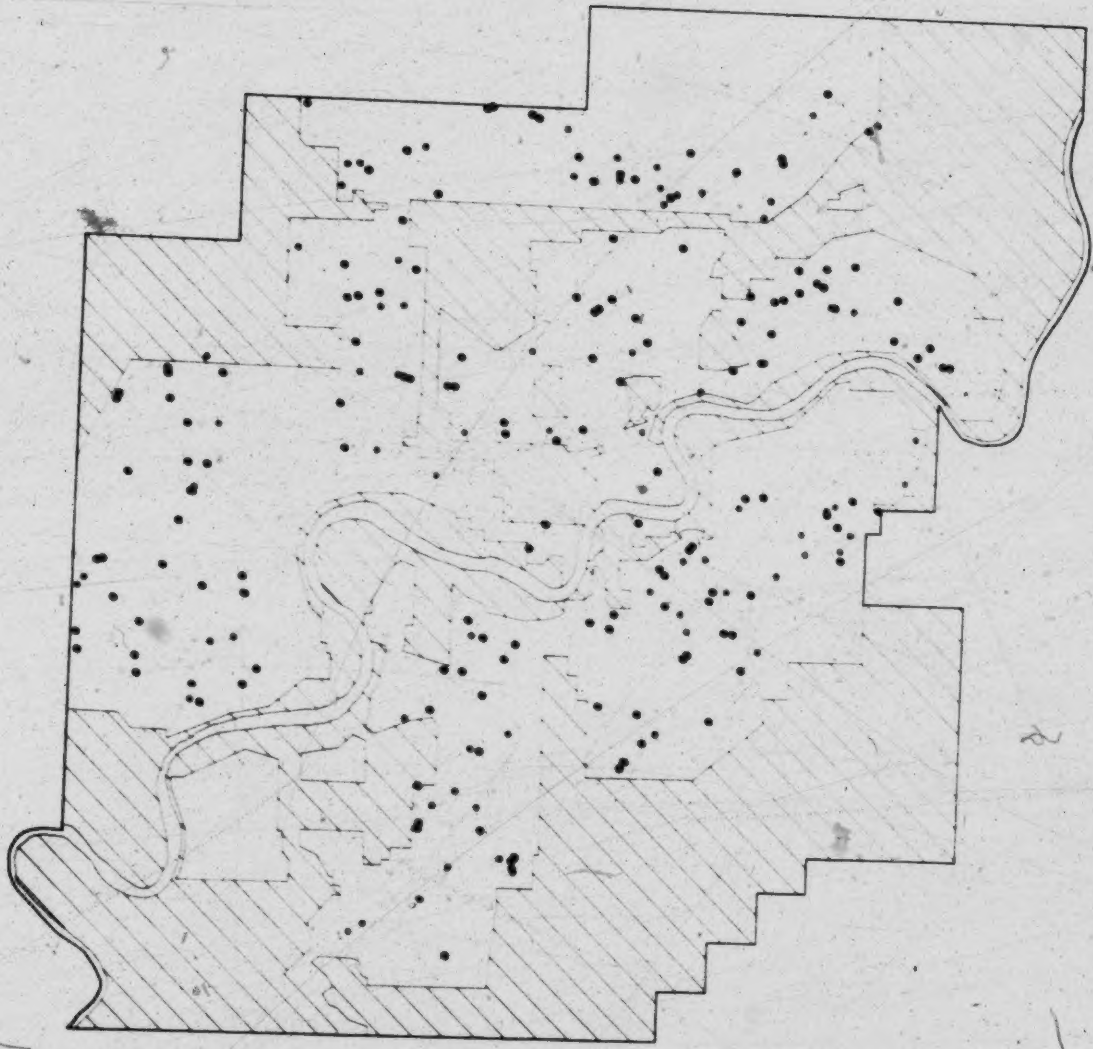
Table 5

CONCENTRIC AND SECTORAL VARIATION OF MOBILITY RATES
HOUSEHOLDS - CHILD-BEARING

Distance from the P.V.I. (1/3 miles)	3	4	5	6	7	8	9	10	11	12	13	14	15
Intra-urban and Left the city as a percentage of the total population	85.7	87.4	82.6	82.6	38.7	61.0	24.3	51.0	60.5	47.5	29.6	50.0	59.1

Sector (degrees)	(a) Intra-urban and Left the city	(b) Total Population	a/b x 100
350 - 100	71	113	62.8
100 - 210	73	155	47.1
210 - 350	75	135	55.6
Total	219	403	54.3

Source: Henderson's Directories and the Edmonton Journal



ORIGINS (1966)

HOUSEHOLDS - CHILD-BEARING
TOTAL SAMPLE

Figure 5

Source: Henderson's Directories and The Edmonton Journal

These three zones were not contiguous and fell between zones of lower than average values (Table 5, Figure 5).

Households - Widowed

Two broad sectors, one of lower and one of higher than average mobility can be described for the widowed households. Most of the southern part of the city was characterized by lower rates of mobility with forty-four per cent of the population being mobile compared to the average of fifty-four per cent. The northern part of the city and some of the eastern portion had higher rates. The total northern zone could be further divided into two sectors. The western portion had the highest rates of mobility with fifty-eight per cent of the households moving. The eastern half was only slightly different with fifty-seven per cent moving (Table 6). Mobility rates showed an inverse relationship with respect to distance from the CBD. There were no distinct breaks but three of the four zones with more than the average proportion of movers were within two miles of the CBD, whereas, only one zone within this distance had less than the average proportion of movers (Table 6, Figure 6).

Interpretation

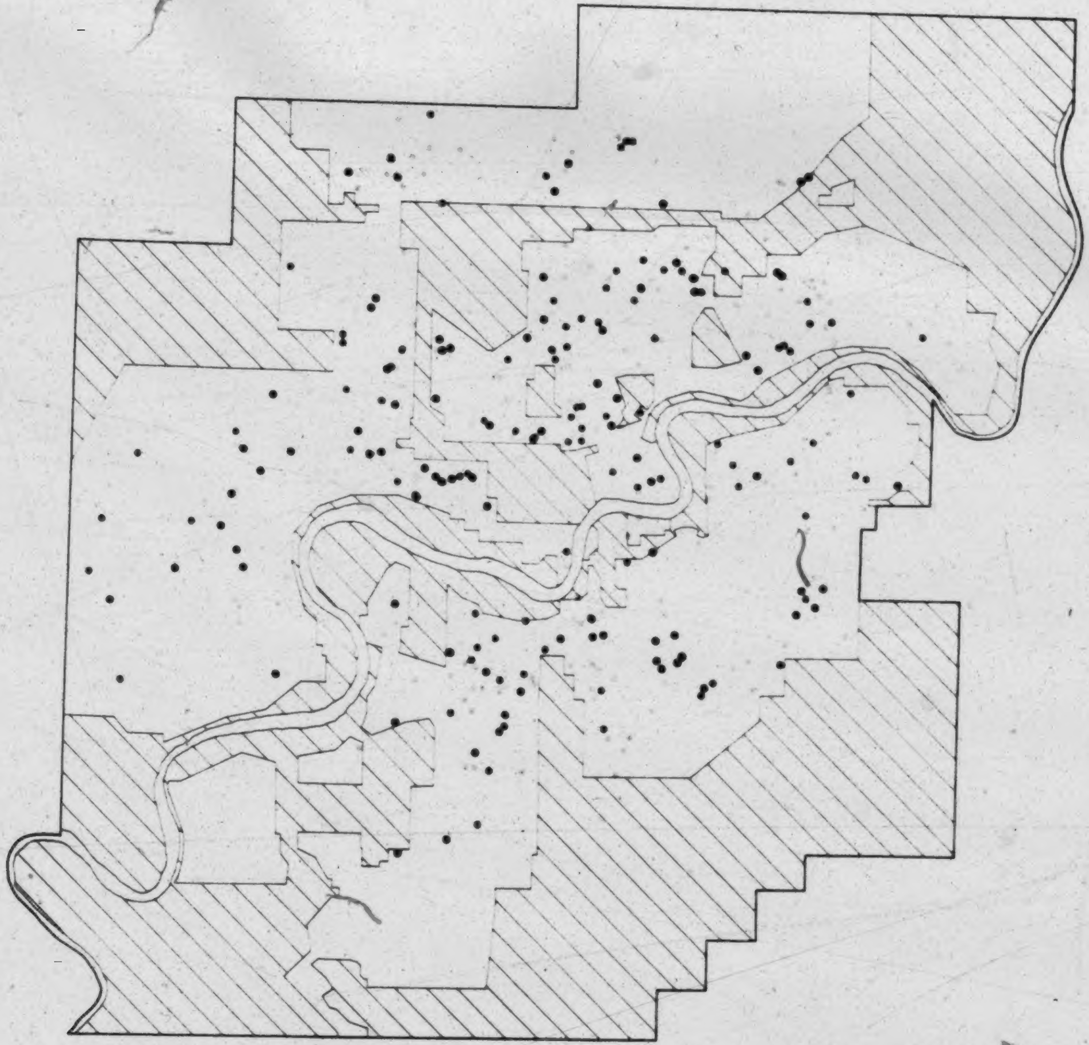
A model of the spatial variation of mobility for a specific stage in the life cycle may be developed using the relocation decision process as a framework. As developed by Wolpert (1965) and presented by Brown and Moore (1970) the decision making process is initiated by stress and strain as effected by a perceived disparity between household requirements and occupied residence. If major household requirements at a specific stage in the life cycle are determined, various

Table 6
CONCENTRIC AND SECTORAL VARIATION OF MOBILITY RATES
HOUSEHOLDS - WIDOWED

Distance from the P.V.I. (1/3 miles)	2	3	4	5	6	7	8	9	10	11	12	13
Intra-urban and Left the city as a percentage of the total population	75.0	59.3	51.7	69.2	50.0	48.7	60.5	40.9	53.1	35.0	50.0	53.8

Sector (degrees)	(a) Intra-urban and Left the city	(b) Total Population	a/b x 100
350 - 110	84	144	58.3
110 - 240	58	104	56.6
240 - 350	34	78	43.6
Total	176	326	54.0

Source: Henderson's Directories and the Edmonton Journal



ORIGINS(1966)

HOUSEHOLDS - WIDOWED
TOTAL SAMPLE

▨ Areas Principally Non-Residential

· Non-movers
● Leaving the city
● Intra-urban movers

Figure 6

Source:Henderson's Directories and The Edmonton Journal areas in the city may be assigned values with respect to the degree to which those areas meet the requirements. From this it may be assumed that those areas in which household requirements are least satisfied will be characterized by high rates of out-movement by households in the particular stage of the life cycle being analyzed. Conversely, areas which meet requirements will experience low rates of mobility of such households. In a similar manner, this concept may be described in terms of locational preference. The propensity to move may be expected to increase with increasing distance of a household from its particular area of preference.

Households - Child-bearing

Principal requirements of families in a child-bearing stage are those of dwelling space and a safe environment for children (Rossi, 1955; Abu Lughod and Foley in Foote et al, 1960; Simmons, 1968; Moore, 1972). High-rise apartments are characteristically the smallest dwelling areas per unit. Walk-up apartments and multiple-family dwellings are increasingly larger and single-family detached dwellings are generally most spacious. These dwelling types tend to vary with distance from the city centre (Berry, 1965, p. 101; McVey, 1971) and it may be assumed that per unit dwelling space decreases towards the city centre. Thus, households nearer the city centre and in the child-bearing stage are more likely to experience a greater difference of space requirements and occupied dwelling space characteristics than are similar households further from the city centre. It may be assumed that increasing difference causes increasing stress and strain which, in turn, will influence an increasing probability of a residential relocation in order to adjust to requirements. A similar argument may be developed using the requirement of a safe environment for children. Intuitively it may be accepted that perceived hazards to children increase towards the city centre (Wolpert, 1965, p. 97). Factors influencing this pattern include increasing population and traffic densities towards the city centre and decreasing space available for play towards central areas.

The analysis of this study's data indicates that households in the child-bearing stage were more likely to move if they were located near the CBD (Table 5). The concentric variation of mobility rates was more pronounced than their sectoral variation, which suggests that distance from the city centre is of greater importance than those factors which tend to vary sectorally. Increasing likelihood to move of households in the child-bearing stage with decreasing distance from the city centre is the result of two factors; the general trend for higher mobility rates in inner areas, and the locational preference pattern of households in the child-bearing stage. As reviewed earlier, these households are more likely to move to outer areas. It follows that those households in the inner areas will be most likely to relocate since they are in an area of perceived disutility.

Households - Widowed

It is difficult to assess the impact of relative spatial location on the mobility of widowed households due to the scarcity of empirical data available with regards to preferences and requirements of these households. Sheldon (1958), in an analysis of the older population of the United States, observed that "... as age increases, the proportion of widows maintaining their own households decreases ..." (Sheldon, 1958, p. 102). In general, the proportion of persons over forty-five years of age decreases outward from the city centre. Since the greater majority of widowed in Alberta in 1966 were over forty-five (Alberta, Vital Statistics 1966) this trend may be assumed for widows. That is, older widows would tend to be located nearer the CBD. It might therefore be posited, in conjunction with Sheldon's observations, that the widowed nearer the CBD would be older and consequently be less likely to maintain their own home than those further away. This would influence an increasing propensity to move nearer the CBD.

Another manner in which the mobility of the widowed may be influenced spatially involves situations where the person is forced to move due to urban renewal, conversion, or redevelopment (Golant, 1972, p. 82). These processes tend to occur outward from the CBD and their effect would be to increase the probable rate of mobility. With respect to dwelling requirements, it has been suggested that there may be a tendency for households to move into a smaller dwelling unit upon the death of a spouse (Simmons, 1968; Adams, 1969). As was mentioned previously, the general pattern is of decreasing size of dwelling units towards the CBD. From this it may be expected that those widowed households in areas distant from the CBD would be in larger dwellings that those close to the CBD. Consequently, on the basis of dwelling size alone, those in outer areas may be expected to have higher rates of mobility. There are also difficulties of financial and physical upkeep associated with larger homes which may reinforce the effect of adjustments to smaller dwellings.

The factors discussed are not complimentary. Some may influence higher rates of mobility near the outer areas, whereas, others may influence higher rates near the CBD. This study's data suggests that those factors influencing higher mobility rates in the inner areas are of greater impact since widowed households were more mobile in the inner areas (Table 6). It therefore is suggested that the pressures to sell a centrally located home in the wake of conversion and redevelopment and the relocation of older widows into the homes of relatives accounted for the increasing rates of mobility towards the CBD. The sectoral variation of mobility rates may also be partly explained in view of conversion and redevelopment. The most stable sector was located south of the North Saskatchewan River, an area characterized by less expansion of non-residential activities than the areas in the north (Table 6).

Summary

In Chapter two it was demonstrated that a change in household structure has impact upon the propensity to move. In this chapter it has been shown that there exists a further differentiation of mobility rates on the basis of location within the city. Together, the temporal and areal analyses of mobility rates have shown that households in which a child has been born or a person has been widowed are more likely to undertake an intra-urban move if they are located near the city centre rather than in the outer areas of the city.

CHAPTER IV

SPATIAL PATTERNS OF ORIGINS

As discussed in Chapter one, households at specific stages in the life cycle are more likely to be located in certain areas of the city. This chapter deals with the observed distribution of origins for the sample households. The principal emphasis is on the influence of stage in life cycle upon residential location although other related factors are also discussed. The following section reviews some empirical and theoretical studies which have examined residential location and the life cycle. Subsequently, this study's data is analyzed and discussed with reference to the literature reviewed.

Review

It has been demonstrated that the concentric variation of demographic, family status, and housing characteristics is basic in urban structure (Berry, 1965 ; Johnston, 1971 ; Moore, 1972). An analysis of 1961 census data shows that this was similarly true for the City of Edmonton. In examining the spatial distribution of census variables for Edmonton, McVey concluded that "the concentric or gradient patterning of [family and household] characteristics were consistently reflected in the city ... " (McVey, 1971, p. 354). Further analysis was carried out for the purpose of this study by assigning a value to each of the sixty-three Edmonton 1961 census tracts representing their relative distance from the CBD. Fifteen variables were regressed against the assigned distance value, and the correlation coefficients were determined. The results support McVey's conclusions and demonstrate that the general theory of concentric variation of demographic, family status, and housing characteristics was true for Edmonton in 1961 (Table 7).

The concentric variation of family types may be partially attributed to the concentric variation of dwelling types. Families with children require more dwelling space than single person households or childless couples. It follows that families with children would account for a relatively larger proportion of the population in areas of larger dwelling units. Apartments are generally less spacious than single detached dwellings which implies that families with children would tend to be located in single detached dwellings and, conversely, single family households and childless couples would represent a relatively greater proportion of the total population located in areas characterized by apartments. These observations are supported in the analysis of Edmonton data (Table 7). The percentage of the total adult population which was married, the percentage of families with children, and the percentage of single detached dwelling units all vary directly with distance from the CBD. Conversely, the percentage of families with no children, the percentage of unmarried adults, and the percentage of apartments all vary inversely with distance from the CBD (Table 7). The relationship described above is that between family size and dwelling size, an important consideration in residential location as was demonstrated in a recent Edmonton study (McCracken, 1973). This relationship has been examined by Abu Lughod and Foley (Foote et al, 1960) as was

Table 7

CONCENTRIC VARIATION OF SELECTED CENSUS VARIABLES
EDMONTON (1961)

Variable		Correlation Coefficient of Variable and distance from the P.V.I.
Per cent population less than 15 years of age		0.858
Per cent population more than 65 years of age		-0.799
Fertility Ratio		0.762
Per cent population more than 15 years of age and married		0.801
Per cent population widowed		-0.784
Children per family		0.834
Per cent of families with	no children	-0.808
	1 or 2 children	0.490
	3 or 4 children	0.806
	more than 4 children	0.764
Per cent of dwellings	owned	0.726
	rented	-0.693
	single detached	0.695
	single attached	0.240
	apartments	-0.786

Source: McVey, 1971

mentioned in Chapter one.

Other reasons of importance in the location decision include ownership aspirations, distance from place of work, cost of dwelling, physical condition of dwelling, and characteristics of neighborhood (McCracken, 1973, p. 85). For a household one or more of these factors may be more important depending on life style and stage in life cycle. Those families which are career oriented may stress proximity to place of work as a desirable location characteristic, whereas, those which are family oriented may opt for an amenable environment for children and proximity to schools or playgrounds. Further comment on these factors will be made in the section following the data analysis. Factors of importance in the location of households in the child-bearing stage and those prior to widowhood will be discussed.

Analysis

Households - Child-bearing

The frequency of child-bearing households generally increased from the city centre to the outer areas up to distances of four to four and one-third miles from the peak value intersection. Beyond four and one-third miles there was a decrease in frequency and no households were more than five and two-thirds miles from the peak value intersection. The highest frequency, sixty-one households or fifteen per cent of the total, occurred in the areas four to four and one-third miles from the peak value intersection (Table 8, Figure 7). The most evident differences between the disaggregated groups were in the relative proportions of households within and beyond two and one-third miles of the peak value intersection. Of those households

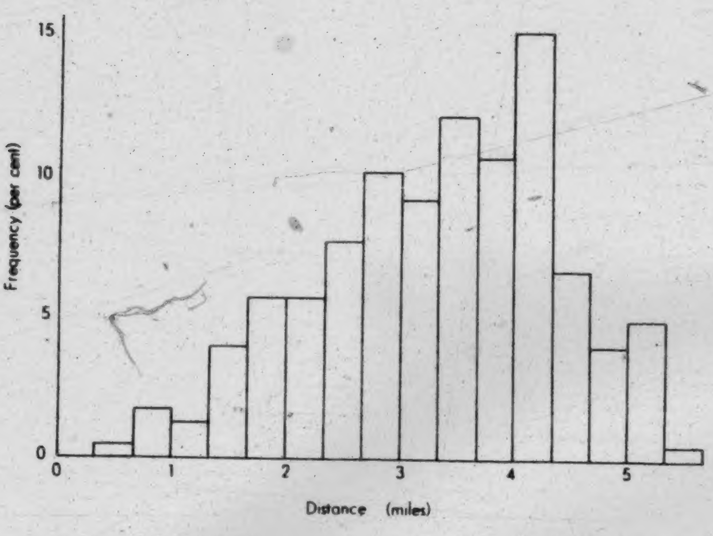
Table 8

LOCATION OF ORIGINS BY DISTANCE FROM THE P.V.I.
HOUSEHOLDS - CHILD-BEARING

Distance (1/3 miles)	Non-movers		Intra-urban		Left the city		Total	
	#	%	#	%	#	%	#	%
1 - 2	0	0	2	1.4	0	0	2	0.5
2 - 3	2	1.1	4	2.8	1	1.3	7	1.7
3 - 4	0	0	3	2.1	2	2.6	5	1.2
4 - 5	2	1.1	9	6.3	5	6.6	16	4.0
5 - 6	4	2.2	12	8.4	7	9.2	23	5.7
6 - 7	4	2.2	17	11.9	2	2.6	23	5.7
7 - 8	19	10.3	5	3.5	7	9.2	31	7.7
8 - 9	16	8.7	17	11.9	8	10.5	41	10.2
9 - 10	28	15.2	6	4.2	3	3.9	37	9.2
10 - 11	24	13.0	15	10.5	10	13.2	49	12.2
11 - 12	17	9.2	14	9.8	12	15.8	43	10.7
12 - 13	32	17.4	20	14.0	9	11.8	61	15.1
13 - 14	19	10.3	5	3.5	3	3.9	27	6.7
14 - 15	8	4.3	7	4.9	1	1.3	16	4.0
15 - 16	9	4.9	5	3.5	6	7.9	20	5.0
16 - 17	0	0	2	1.4	0	0	2	0.5
Totals	184	100	143	100	76	100	403	100

Source: Henderson's Directories and the Edmonton Journal

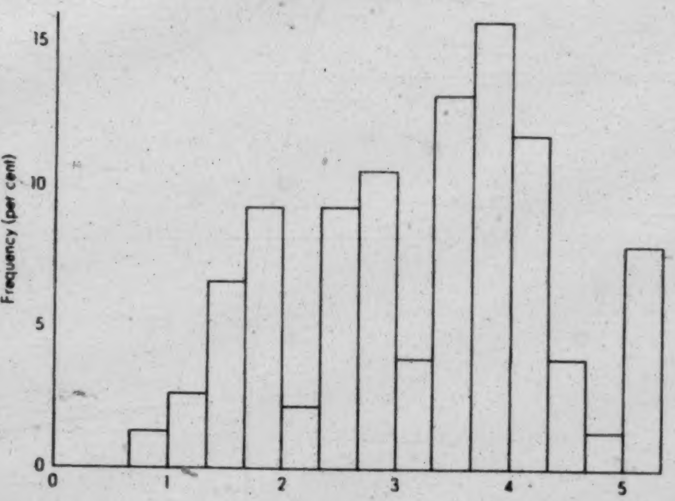
DISTRIBUTION OF ORIGINS
BY DISTANCE FROM THE P.V.I.



HOUSEHOLDS — CHILD-BEARING TOTAL SAMPLE

Figure 7 SOURCE: HENDERSON'S DIRECTORIES AND THE EDMONTON JOURNAL

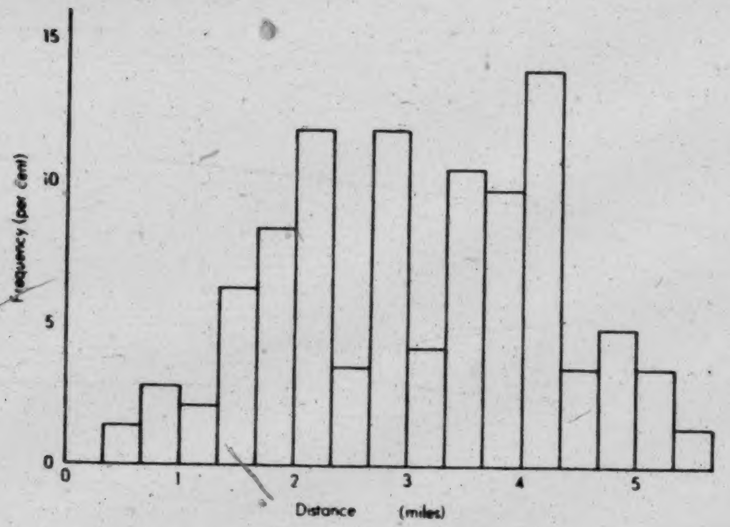
DISTRIBUTION OF ORIGINS
BY DISTANCE FROM THE P.V.I.



HOUSEHOLDS — CHILD-BEARING LEAVING THE CITY

Figure 8 SOURCE: HENDERSON'S DIRECTORIES AND THE EDMONTON JOURNAL

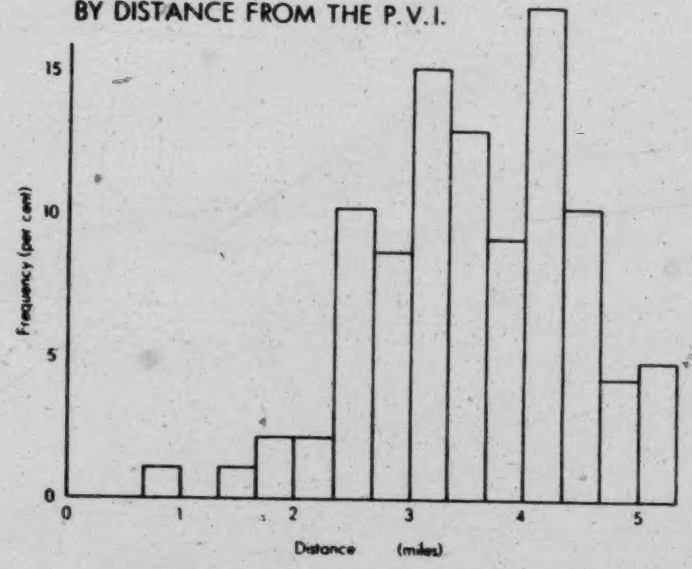
DISTRIBUTION OF ORIGINS
BY DISTANCE FROM THE P.V.I.



HOUSEHOLDS — CHILD-BEARING INTRA-URBAN MOVERS

Figure 9 SOURCE: HENDERSON'S DIRECTORIES AND THE EDMONTON JOURNAL

DISTRIBUTION OF ORIGINS
BY DISTANCE FROM THE P.V.I.



HOUSEHOLDS — CHILD-BEARING NON-MOVERS

Figure 10 SOURCE: HENDERSON'S DIRECTORIES AND THE EDMONTON JOURNAL

that did not move within the five year study period (Figure 10) only six and one-half per cent were located within two and one-third miles, whereas, the proportions for intra-urban movers (Figure 9) and those that left the city (Figure 8) were thirty-three per cent and twenty-two per cent, respectively. In general, each sub-group had a greater proportion of households in the outer half of the city with the division being most evident for non-movers and least differentiated for intra-urban movers (Table 8).

The angular distribution of origins indicates that three areas were under-represented. Sectors in the north north-west, south-west, and south and east contained considerably fewer household origins than the average value. With only two exceptions, the other areas ranged in frequency from two and one-half to five per cent of all households per ten degree sector. The expected frequency for an even distribution is about three per cent per ten degree sector (Table 9). Patterns of angular distribution were more irregular for the three composite groups. Those sectors with less than the average percentage of households in the aggregate patterns had less for the group of non-movers. Proportionally more non-moving households (Figure 11) had their 1966 locations in areas to the east, north north-east, and west south-west of the city centre than did the total sample. For those that left the city (Figure 12) the most evident divergence from the total pattern is the relatively high concentration in the north-west area, and a relative lack of sample households in the north-east. Intra-urban movers (Figure 13) also had a relatively small number of origins in the north-east. Their greatest divergence from all other patterns was the low frequency of households east of the city centre (Table 9).

Table 9

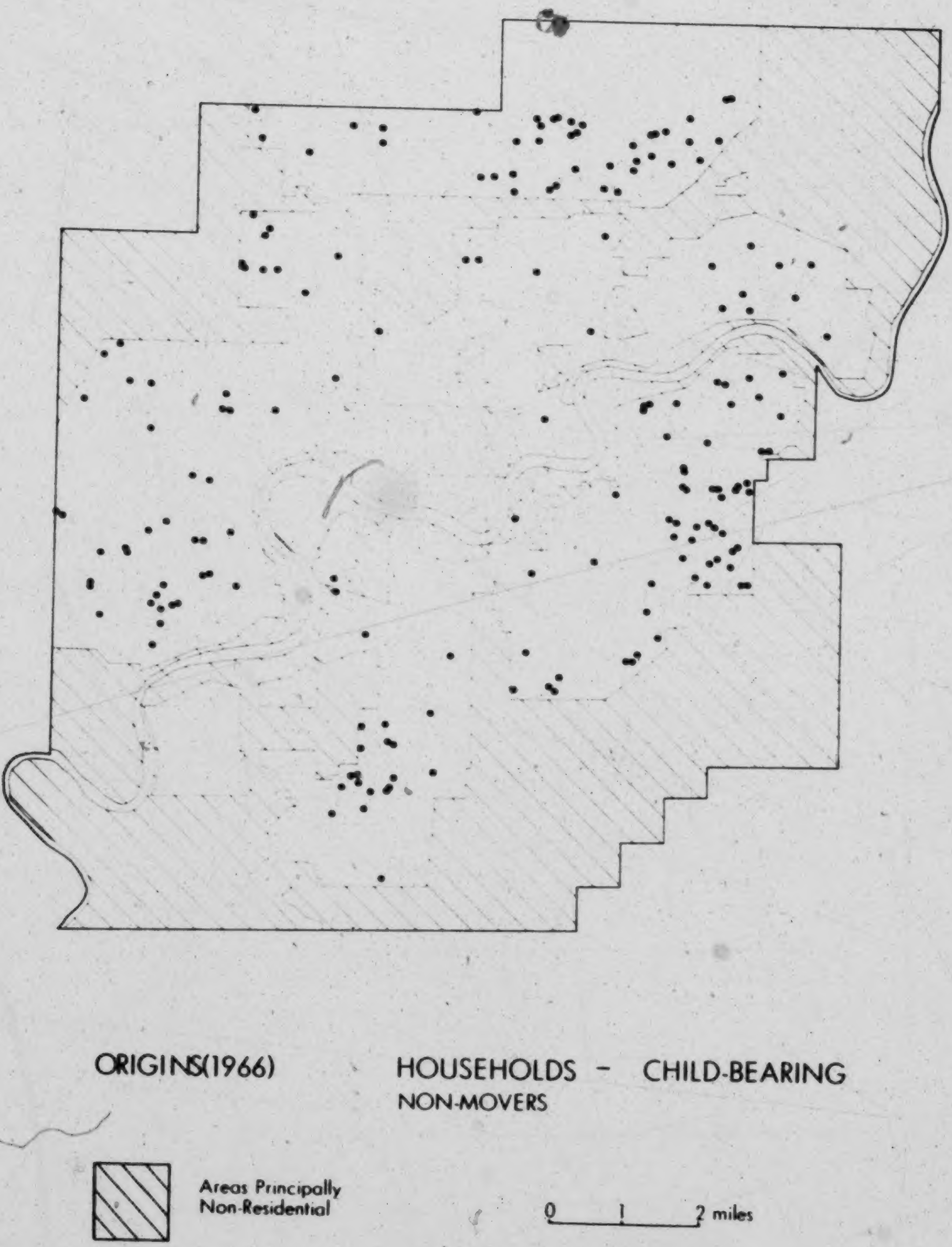
LOCATION OF ORIGINS BY ANGLE OF ORIGIN
HOUSEHOLDS - CHILD-BEARING

Angle (degrees)	Non-movers		Intra-urban		Left the city		Total	
	#	%	#	%	#	%	#	%
0 - 10	4	2.2	4	2.8	2	2.6	10	2.5
10 - 20	6	3.3	7	4.9	3	3.9	16	4.0
20 - 30	1	0.5	1	0.7	0	0	2	0.5
30 - 40	3	1.6	3	2.1	3	3.9	9	2.2
40 - 50	6	3.3	8	5.6	3	3.9	17	4.2
50 - 60	4	2.2	5	3.5	5	6.6	14	3.5
60 - 70	1	0.5	2	1.4	1	1.3	4	1.0
70 - 80	2	1.1	3	2.1	2	2.6	7	1.7
80 - 90	4	2.2	2	1.4	2	2.6	8	2.0
90 - 100	7	3.8	8	5.6	2	2.6	17	4.2
100 - 110	11	6.0	6	4.2	4	5.3	21	5.2
110 - 120	11	6.0	4	2.8	2	2.6	17	4.2
120 - 130	8	4.3	4	2.8	4	5.3	16	4.0
130 - 140	1	0.5	11	7.7	2	2.6	14	3.5
140 - 150	7	3.8	4	2.8	3	3.9	14	3.5
150 - 160	1	0.5	4	2.8	0	0	5	1.2
160 - 170	11	6.0	1	0.7	1	1.3	13	3.2
170 - 180	5	2.7	3	2.1	2	2.6	10	2.5

Table 9 (continued)

Angle (degrees)	Non-movers #	 %	Intra-urban #	 %	Left the city #	 %	Total #	 %
180 - 190	11	6.0	3	2.1	5	6.6	19	4.7
190 - 200	7	3.8	2	1.4	2	2.6	11	2.7
200 - 210	9	4.9	3	2.1	3	3.9	15	3.7
210 - 220	3	1.6	6	4.2	1	1.3	10	2.5
220 - 230	3	1.6	2	1.4	3	3.9	8	2.0
230 - 240	3	1.6	3	2.1	0	0	6	1.5
240 - 250	2	1.1	1	0.7	1	1.3	4	1.0
250 - 260	4	2.2	6	4.2	0	0	10	2.5
260 - 270	1	0.5	1	0.7	0	0	2	0.5
270 - 280	2	1.1	3	2.1	2	2.6	7	1.7
280 - 290	10	5.4	5	3.5	6	7.9	21	5.2
290 - 300	7	3.8	6	4.2	3	3.9	16	4.0
300 - 310	1	0.5	5	3.5	2	2.6	8	2.0
310 - 320	1	0.5	0	0	0	0	1	0.2
320 - 330	2	1.1	3	2.1	0	0	5	1.2
330 - 340	11	6.0	2	1.4	4	5.3	17	4.2
340 - 350	10	5.4	8	5.6	2	2.6	20	5.0
350 - 360	4	2.2	4	2.8	1	1.3	9	2.2
Totals	184	100	143	100	76	100	403	100

Source: Henderson's Directories and the Edmonton Journal



ORIGINS(1966) HOUSEHOLDS - CHILD-BEARING
NON-MOVERS

Figure 11 Source: Henderson's Directories and The Edmonton Journal

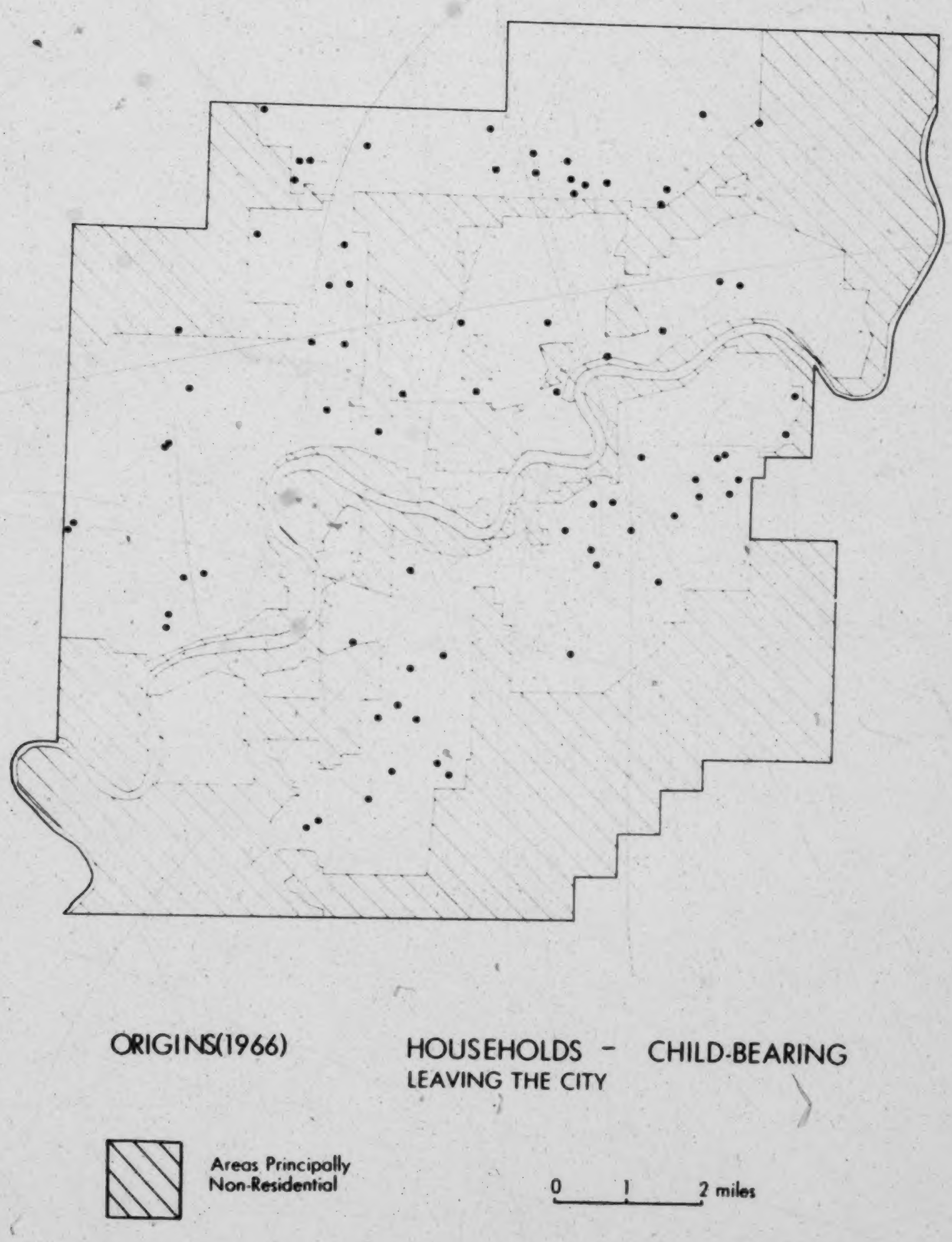
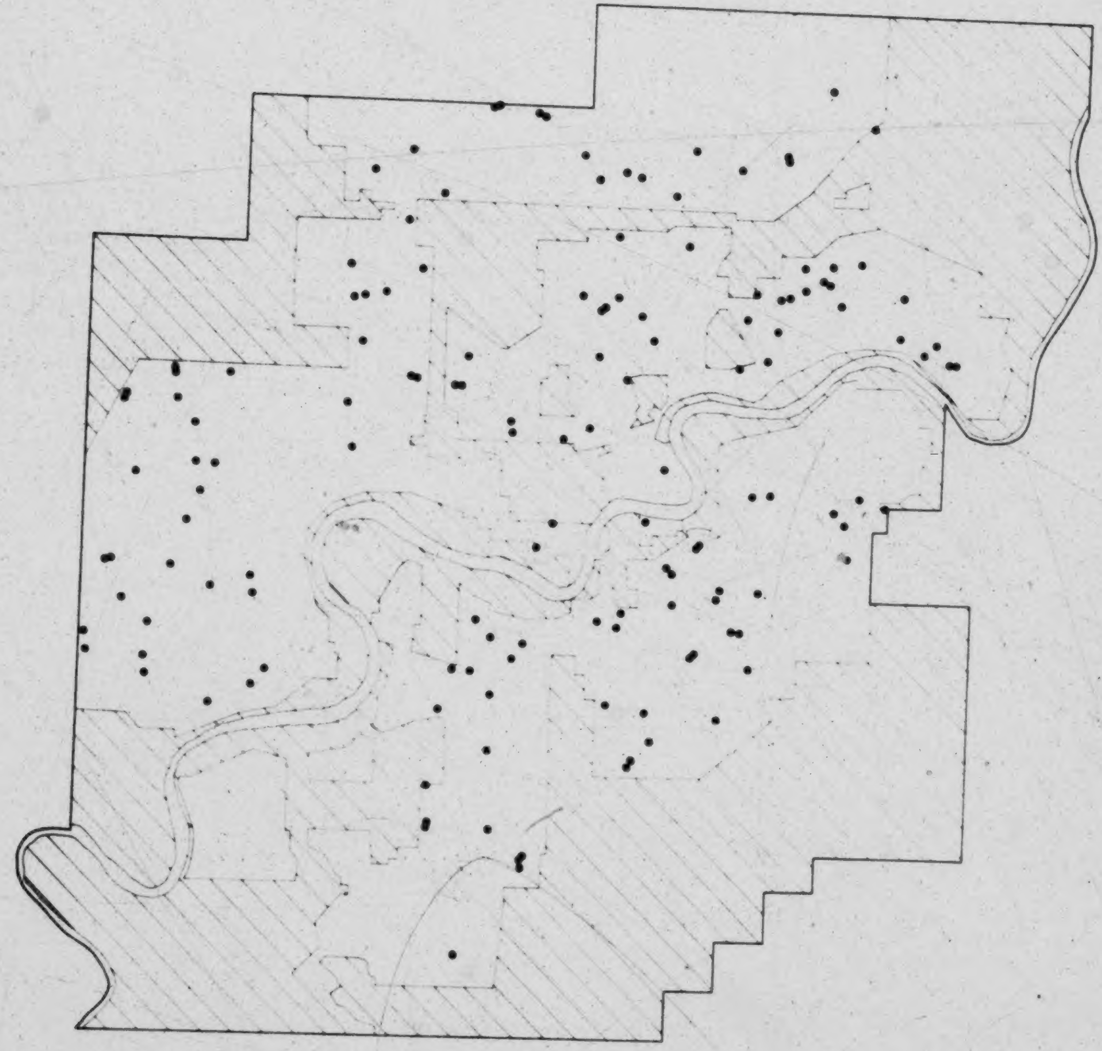

ORIGINS(1966)
HOUSEHOLDS - CHILD-BEARING
LEAVING THE CITY
▨ Areas Principally Non-Residential
0
1
2 miles

Figure 12

Source: Henderson's Directories and The Edmonton Journal



ORIGINS(1966)

HOUSEHOLDS - CHILD-BEARING
INTRA-URBAN MOVERS

▨ Areas Principally Non-Residential

Figure 13 Source: Henderson's Directories and The Edmonton Journal

Households - Widowed

For this group, origins were most frequent at middle distances with a similar decline in frequency towards and away from the peak value intersection. The high frequency of forty-eight households, or fifteen per cent of the total, occurred in the area two to two and one-third miles from the city centre. There were no origins within one-third or beyond five and one-third miles of the peak value intersection (Figure 14). The distribution of non-movers closely resembles that of the total pattern except that the range was less, two-thirds to five miles from the peak value intersection. The area one and two-thirds to two miles from the city centre contained only five per cent of all non-movers, about one-half of that which could be expected from a general trend (Figure 17). The distributions of intra-urban movers (Figure 16) and those that left the city (Figure 15) were much less regular than either the total or non-movers sample but, the general mid-distance peak, and inward and outward declines in frequency could be observed (Table 10).

The pattern of angular distribution for the total sample indicated three areas which diverge from a regular distribution. An area west of the city centre contained more households than the average and two areas, one south-west and one east south-east, were under-represented (Table 11). It can be seen from the disaggregate patterns that the over-representation west of the city centre consists mainly of non-movers (Figure 18) and intra-urban movers (Figure 20). The lower proportion of households in the southern areas is influenced by the distribution of those that left the city (Figure 19). Other

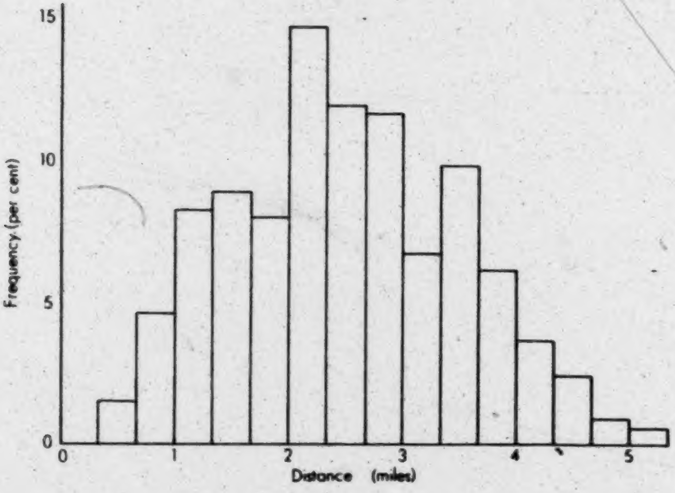
Table 10

LOCATION OF ORIGINS BY DISTANCE FROM THE P.V.I.
HOUSEHOLDS - WIDOWED

Distance (1/3 miles)	Non-movers		Intra-urban		Left the city		Total	
	#	%	#	%	#	%	#	%
1 - 2	0	0	0	0	5	5.3	5	1.5
2 - 3	5	3.3	6	7.3	4	4.3	15	4.6
3 - 4	11	7.3	7	8.5	9	9.6	27	8.3
4 - 5	14	9.3	7	8.5	8	8.5	29	8.9
5 - 6	8	5.3	7	8.5	11	11.7	26	8.0
6 - 7	24	16.0	16	19.5	8	8.5	48	14.7
7 - 8	20	13.3	6	7.3	13	13.8	39	12.0
8 - 9	15	10.0	11	13.4	12	12.8	38	11.7
9 - 10	13	8.7	3	3.7	6	6.4	22	6.8
10 - 11	15	10.0	11	13.4	6	6.4	32	9.8
11 - 12	13	8.7	1	1.2	6	6.4	20	6.1
12 - 13	6	4.0	5	6.1	1	1.1	12	3.7
13 - 14	5	3.3	1	1.2	2	2.1	8	2.5
14 - 15	1	0.7	1	1.2	1	1.1	3	0.9
15 - 16	0	0	0	0	2	2.1	2	0.6
Totals	150	100	82	100	94	100	326	100

Source: Henderson's Directories and the Edmonton Journal

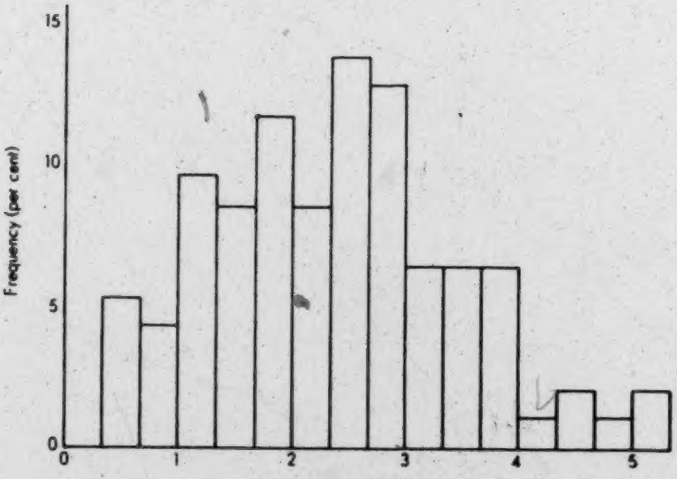
DISTRIBUTION OF ORIGINS
BY DISTANCE FROM THE P.V.I.



HOUSEHOLDS – WIDOWED TOTAL SAMPLE

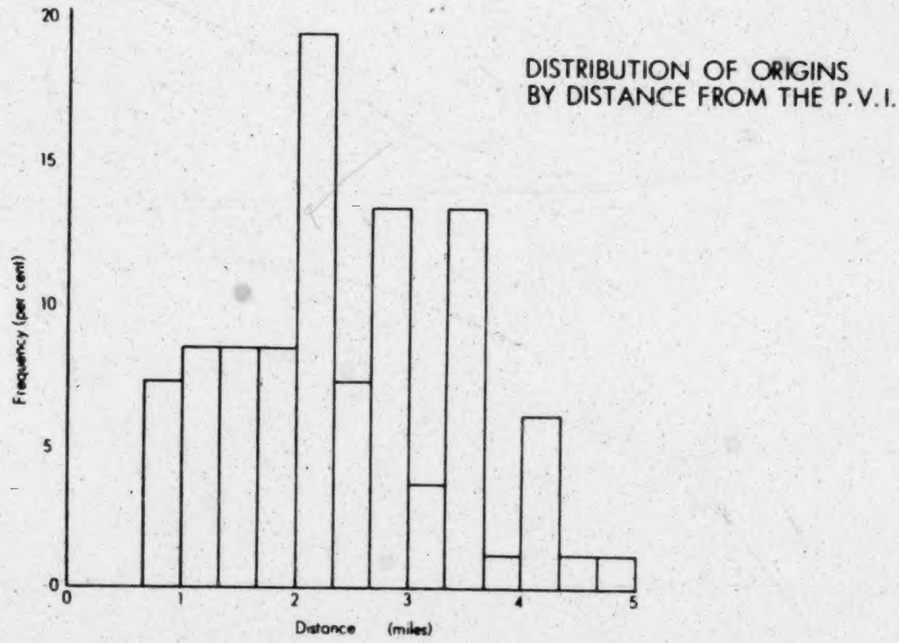
Figure 14 SOURCE: HENDERSON'S DIRECTORIES AND THE EDMONTON JOURNAL

DISTRIBUTION OF ORIGINS
BY DISTANCE FROM THE P.V.I.



HOUSEHOLDS – WIDOWED LEAVING THE CITY

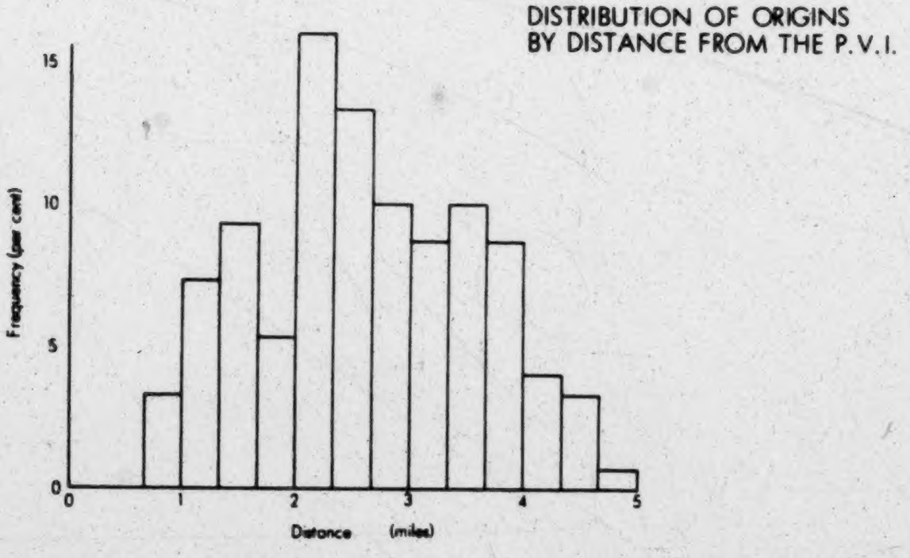
Figure 15 SOURCE: HENDERSON'S DIRECTORIES AND THE EDMONTON JOURNAL



DISTRIBUTION OF ORIGINS
BY DISTANCE FROM THE P.V.I.

HOUSEHOLDS – WIDOWED **INTRA-URBAN MOVERS**

Figure 16 SOURCE: HENDERSON'S DIRECTORIES AND THE EDMONTON JOURNAL



DISTRIBUTION OF ORIGINS
BY DISTANCE FROM THE P.V.I.

HOUSEHOLDS – WIDOWED **NON-MOVERS**

Figure 17 SOURCE: HENDERSON'S DIRECTORIES AND THE EDMONTON JOURNAL

Table 11

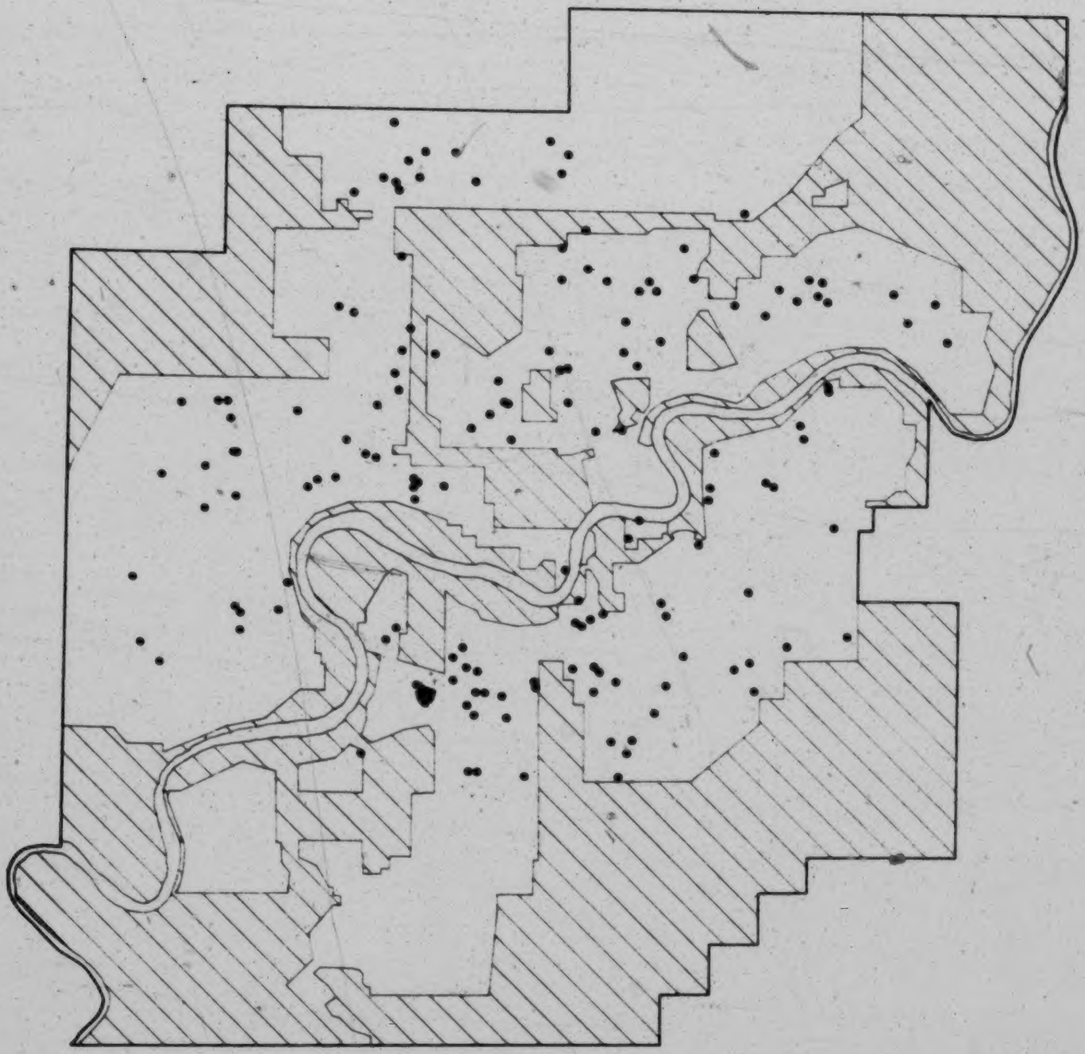
LOCATION OF ORIGINS BY ANGLE OF ORIGIN
HOUSEHOLDS - WIDOWED

Angle (degrees)	Non-movers		Intra-urban		Left the city		Total	
	#	%	#	%	#	%	#	%
0 - 10	13	8.7	7	8.5	3	3.2	23	7.1
10 - 20	8	5.3	6	7.3	4	4.3	18	5.5
20 - 30	1	0.7	1	1.2	2	2.1	4	1.2
30 - 40	3	2.0	2	2.4	3	3.2	8	2.5
40 - 50	5	3.3	3	3.7	3	3.2	11	3.4
50 - 60	4	2.7	4	4.9	1	1.1	9	2.8
60 - 70	10	6.7	2	2.4	4	4.3	16	4.9
70 - 80	2	1.3	2	2.4	1	1.1	5	1.5
80 - 90	6	4.0	3	3.7	4	4.3	13	4.0
90 - 100	5	3.3	1	1.2	7	7.4	13	4.0
100 - 110	2	1.3	4	4.9	10	10.6	16	4.9
110 - 120	7	4.7	3	3.7	4	4.3	14	4.3
120 - 130	3	2.0	4	4.9	2	2.1	9	2.8
130 - 140	7	4.7	2	2.4	1	1.1	10	3.1
140 - 150	3	2.0	2	2.4	6	6.4	11	3.4
150 - 160	5	3.3	1	1.2	4	4.3	10	3.1
160 - 170	3	2.0	1	1.2	5	5.3	9	2.8
170 - 180	4	2.7	2	2.4	3	3.2	9	2.8

Table 11 (continued)

Angle (degrees)	Non-movers #	Non-movers %	Intra-urban #	Intra-urban %	Left the city #	Left the city %	Total #	Total %
180 - 190	1	0.7	0	0	1	1.1	2	0.6
190 - 200	2	1.3	1	1.2	0	0	3	0.9
200 - 210	3	2.0	4	4.9	1	1.1	8	2.5
210 - 220	1	0.7	0	0	1	1.1	2	0.6
220 - 230	5	3.3	1	1.2	2	2.1	8	2.5
230 - 240	2	1.3	6	7.3	1	1.1	9	2.8
240 - 250	2	1.3	0	0	0	0	2	0.6
250 - 260	11	7.3	3	3.7	2	2.1	16	4.9
260 - 270	3	2.0	1	1.2	1	1.1	5	1.5
270 - 280	3	2.0	0	0	1	1.1	4	1.2
280 - 290	4	2.7	3	3.7	8	8.5	15	4.6
290 - 300	6	4.0	2	2.4	4	4.3	12	3.7
300 - 310	5	3.3	2	2.4	1	1.1	8	2.5
310 - 320	0	0	0	0	0	0	0	0
320 - 330	2	1.3	2	2.4	0	0	4	1.2
330 - 340	3	2.0	0	0	1	1.1	4	1.2
340 - 350	5	3.3	3	3.7	0	0	8	2.5
350 - 360	1	0.7	4	4.9	3	3.2	8	2.5
Totals	150	100	84	100	94	100	326	100

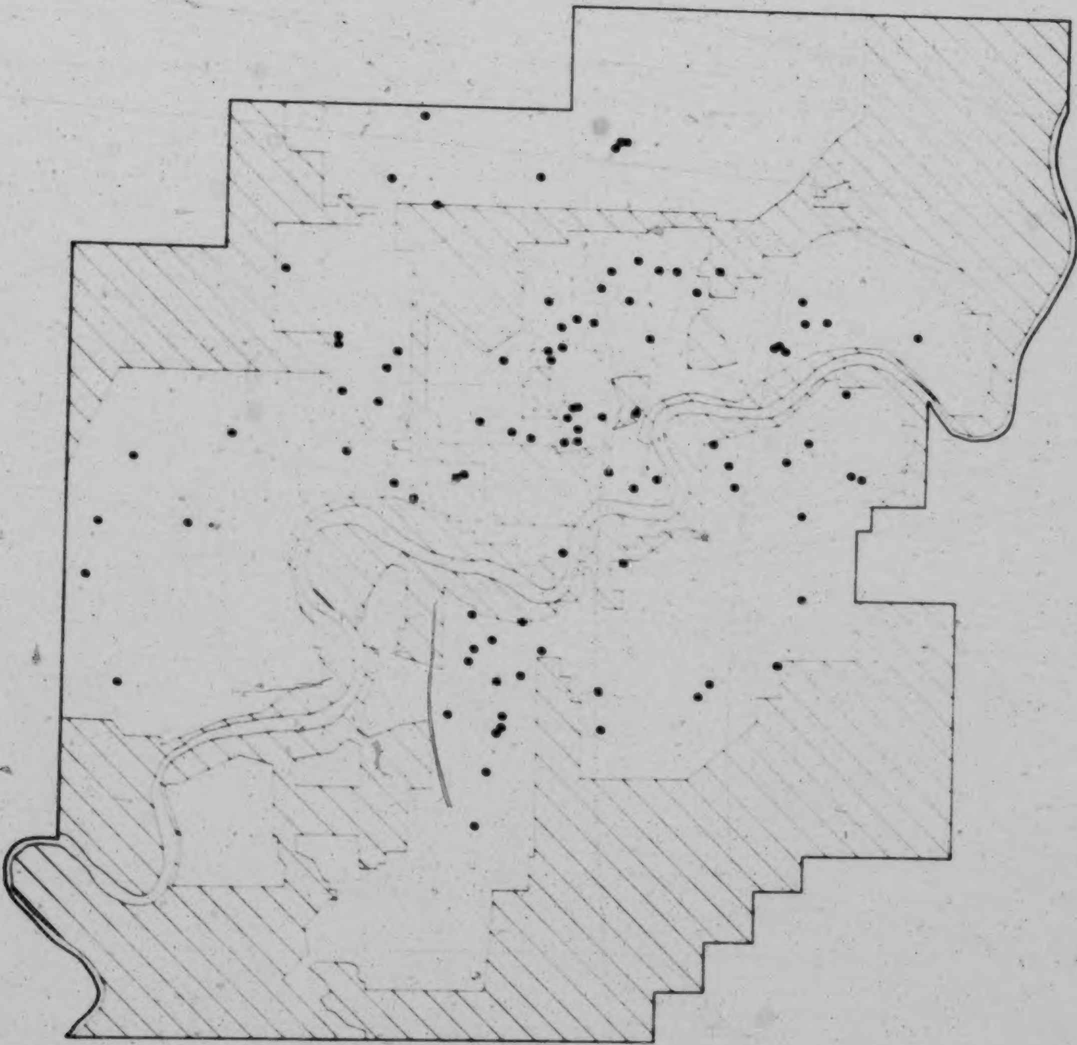
Source: Henderson's Directories and the Edmonton Journal



ORIGINS(1966) HOUSEHOLDS - WIDOWED
NON-MOVERS

▨ Areas Principally Non-Residential

Figure 18 Source: Henderson's Directories and The Edmonton Journal



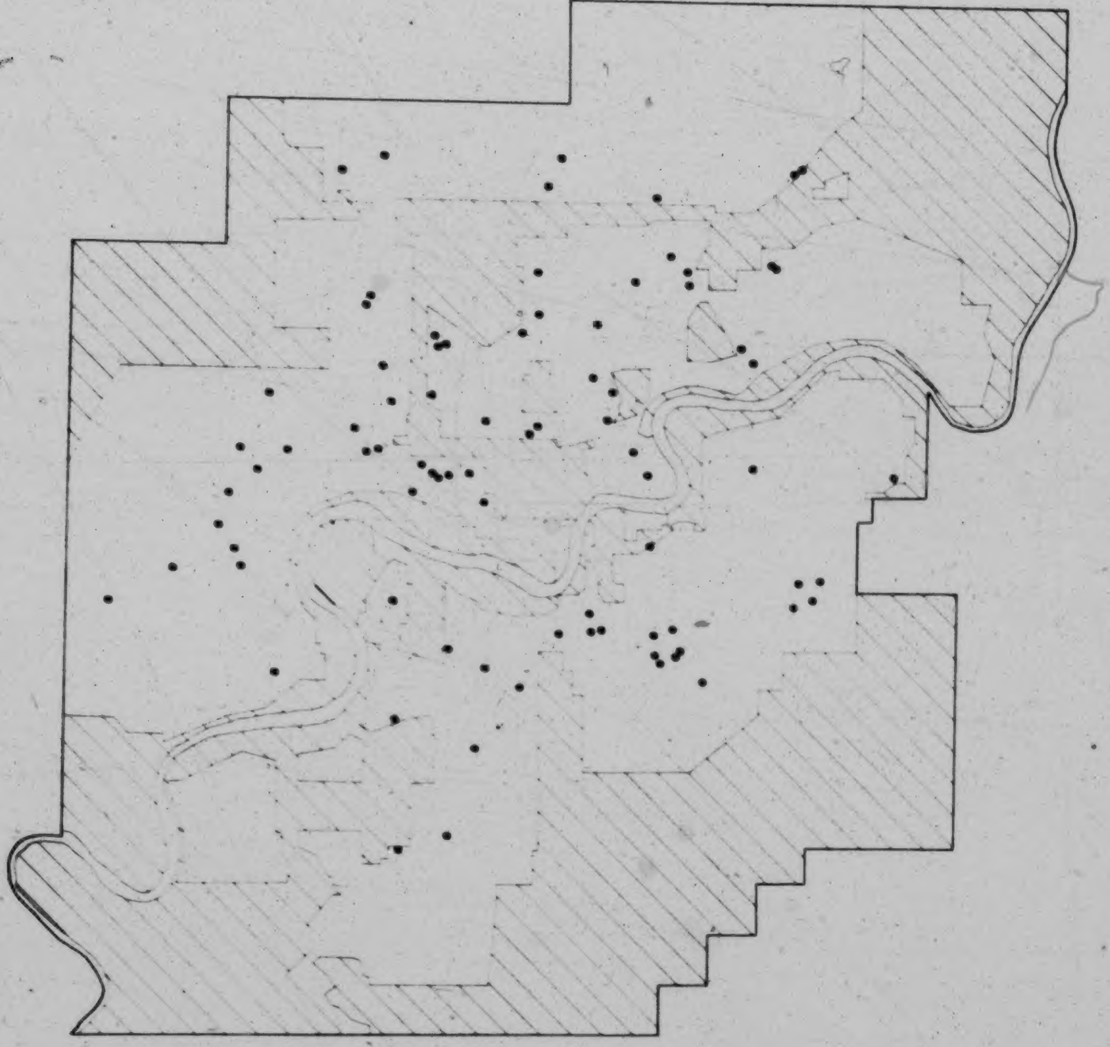
ORIGINS(1966)

HOUSEHOLDS - WIDOWED
LEAVING THE CITY

▨ Areas Principally Non-Residential

Figure 19

Source: Henderson's Directories and The Edmonton Journal



ORIGINS(1966) HOUSEHOLDS - WIDOWED

INTRA-URBAN MOVERS

Figure 20 Source: Henderson's Directories and The Edmonton Journal

than for one area in the south south-west, the entire southern portion of the city had very few households that left the city by 1971. In general the non-movers and intra-urban movers were located in the north and west whereas, those that left the city were located in the north and east (Table 11).

Interpretation

Households - Child-bearing

Households in the child-bearing stage are at a transition stage in the life cycle between the pre-child, or minimum size family stage and the child-rearing, or maximum size family stage. From this it may be hypothesized that the distribution of households in the child-bearing stage will reflect a transition from the distribution of young, childless families to those in the child-bearing stage. The concept of outward movement in a series of short moves as a family progresses through the life cycle was outlined by Abu Lughod and Foley (Foote et al, 1960). Some households, however, may make only one move from inner to outer areas and still others may be located in the outer areas in the pre-child stage. The majority, however, may be expected to be in the middle areas as a result of their initial move to these child-rearing areas.

The distribution of origins in this study is that of a population which is generally as outlined in the previous paragraph. Most of the households are in the middle areas, some are still in the inner areas, and some are already located in the outer areas. Certain aspects of the middle areas in Edmonton make them places of relatively greater utility for households in the child-bearing stage. At a time when the husband's income has not yet reached a peak and the wife is likely to be engaged in home duties, the household may experience some restriction upon income available for housing expenditure. A newer, owned home may as yet be too great an investment, and yet the smaller size of apartments may be undesirable due to the expanding size of the family. Older, single family homes, often less expensive than those in the outer areas, and possibly available on a rental basis, are more common in the middle areas of the city. By locating in such a home the household satisfies its space requirements within the economic restraints at that time. Thus a compromise is reached which temporarily locates the household in a location of maximum place utility.

As may be seen in the analysis there are those households which are located in the outer areas and some in the inner areas. This is to be explained in terms of the individual household's unique perception of place utility. Those that remain in the inner areas delay their move to a dwelling in the outer areas in order to avoid a transitional move whereas those in the outer areas may have moved in spite of some economic difficulties if they perceived these as being less important than the difficulties caused by a space shortage. Not all locations are explained in this fashion, however, since some households may choose an inner location in spite of space needs. There are also dwellings of adequate size in the inner areas although these are less frequent than in the middle and outer areas. In general, it appears that the study sample represents households in a transitional stage, that of child-bearing, which is reflected in their spatial distribution of residences.

Households - Widowed

The major difficulty in describing where persons are most likely to be located prior to widowhood is that the event is not significantly exclusive to a particular age group or life cycle stage. There was a high correlation (0.961) between per cent widowed and per cent over sixty-five years of age in Edmonton for 1966 but, the number of widowed persons includes all widowed and is not necessarily indicative of the frequency of those recently widowed. This can be seen from an analysis of age at death of married persons. First, four demographic facts must be considered. A higher proportion of males died in all age groups from fifteen and over than did females (Alberta, Vital Statistics, 1966, Table 7, p. 68). Age at marriage is lower for women than for men. Women have a greater life expectancy than men. Death rates increase with age. These facts indicate that in most cases the widowed person will be the younger member of the marriage. Therefore, by calculating the mean age at death of married persons, an upper limit is also calculated for the age of the widowed. In Alberta this age was sixty-eight years (Alberta, Vital Statistics, 1966, Table 9, p. 105). Assuming a spacing of at least three years between husband and wife it may be seen that more than one-half of those widowed were less than sixty-five years of age at the time of widowhood. Therefore, some other measure must be used as an indicator for this particular sub-population. A tentative hypothesis may be formulated by examining the probable locational history of households prior to widowhood. The basic assumption made is that prior to widowhood the majority of households will be in either the child-launching or post-child stage. From data presented earlier it may be assumed that the median age at widowhood is above fifty. From this it may be inferred that a majority of households prior to widowhood have entered the child-launching or post-child stage. It is also assumed, with reference to the life cycle concept, that after the household has entered the child-rearing stage it becomes residentially stable. Therefore, prior to widowhood it may be expected that the households would be located in the preferred child-rearing areas, the outer areas of the city at that time. With low rates of mobility the households may be expected to remain in these areas for some time. But, while the household progresses through the child-rearing, child-launching and post-child stages, the urban area expands. At the time of widowhood the outer areas in which the households located have become the middle areas of the city. The urban area literally grew beyond them.

Some substantiation of this hypothesis is provided if the distribution of households in the child-bearing stage (Figure 7) is compared with that of widowed households (Figure 14). Shifting the distribution of widowed households outward by one and one-third miles makes it quite similar to that of households in the child-bearing stage. Similarly, by shifting the distribution of widowed households one-third of a mile further outward, there is generated an approximation of the distribution of destinations of households in the child-bearing stage (Figure 30). Since these households were most likely to be in the latter stages of the life cycle, the origins of households prior to widowhood are distributed in a pattern that suggests that their location is a function of their history.

CHAPTER V

SPATIAL BIASES OF MOVES

Once the location of the origin has been determined all moves may be described in terms of two spatial measures, the length and direction of move from that origin (Figure 21). Frequently, two other measures are added to these basic measures, the angle of move with respect to the origin or some arbitrarily chosen reference point such as the CBD or PVI. Although these can be derived from the basic measures of origin, length and direction of move, they are often treated independently. This might be attributed to the fact that the sector is used in models of urban structure, particularly those dealing with socio-economic variables and with mental maps (Hoyt, 1939; Adams, 1969). The sector is also a convenient figure into which a circular area may be partitioned.

The spatial bias of intra-urban moves has been examined in terms of distance, directional, and sectoral biases (Brown and Holmes, 1971, p. 104). Each of these biases has been associated with factors of impact in residential mobility. This chapter contains sections on distance, directional, and sectoral bias. Each section consists of a theoretical discussion, analysis of study data, and a discussion of the analysis.

VARIABLES DEFINING LOCATION OF DESTINATION

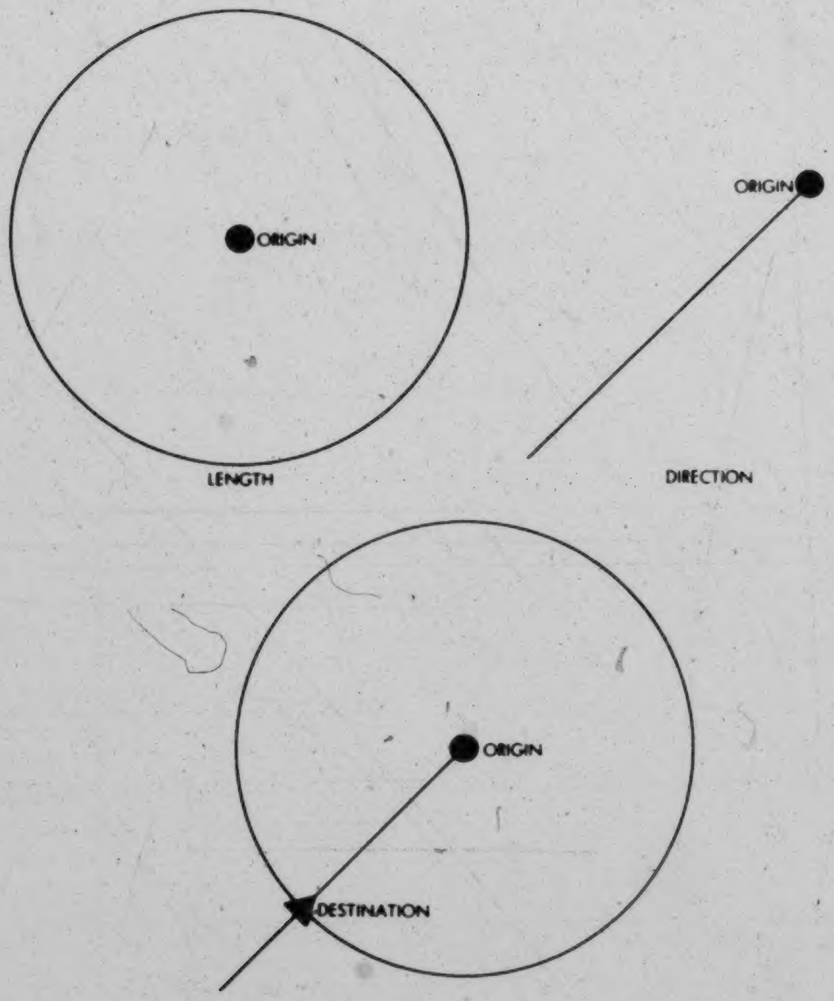


Figure 21

DISTANCE BIAS

Review

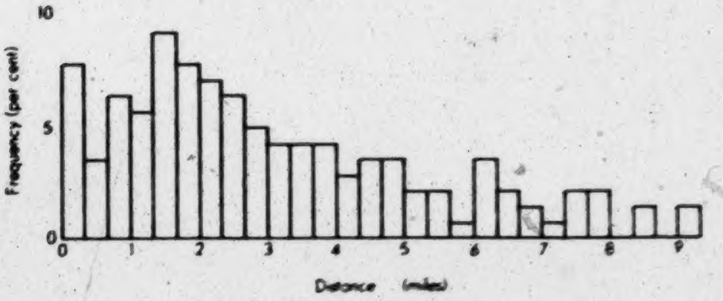
> Distance bias describes the degree to which
> a single migration is more likely to end in
> a nearby place than one more distant.
> (Brown and Holmes, 1971, p. 104)

In the most elementary case, the length of move is a measure of the magnitude of spatial displacement from its origin that a household experiences. This, however, is seldom the manner in which length of move is interpreted. The effects of distance have been the subject of much geographical inquiry and length of move has enjoyed its fair share of this inquiry. It is well documented in the literature that the frequency of moves decreases with increasing length of move (Moore, 1966, p. 19). Various points of view have been taken in an attempt to explain this observed spatial bias. Stouffer introduced the concept of intervening opportunities, proposing that " ... the number of persons going a given distance is directly proportional to the number of opportunities at that distance and inversely proportional to the number of intervening opportunities." (Stouffer, 1940, p. 846). There are difficulties in operationalizing Stouffer's model as he himself mentions (Stouffer, 1940, pp. 846 - 847) and, as Moore comments (Moore, 1972, pp. 39 - 40). Nevertheless, there is some conceptual appeal to this approach. If Stouffer's proposition is accepted, it may be seen that the inverse effect of intervening opportunities will become progressively greater than the direct effect of opportunities at increasing distances. This is due to the rate at which intervening opportunities and opportunities increase. Where opportunities might be expected to increase arithmetically, intervening opportunities increase cumulatively. Merely to maintain an equivalent frequency of each variable at all distances, opportunities must double at regular distance intervals. It is unlikely for such a situation to exist. Thus, if Stouffer's concept is assigned some validity, the impact of intervening opportunities will be that of causing a bias towards short distance moves. The effect of distance on the volume of migration as suggested by Stouffer would be magnified by the impact of the distance-decay properties of an individual's information field. Residential location depends upon the number and distribution of alternative locations of which the intended migrant is aware. This depends upon information possessed initially, that which is gathered in the search process, and information available to the individual. In each case there is a decline in frequency with increasing distance from the individual's origin (Brown and Moore, 1970, pp. 204 - 207). The effect is one of increasing the probability of shorter moves since at greater distances the individual is aware of fewer relocation opportunities. A similar line of reasoning is incorporated in the mental map concept (Adams, 1969). A person's cognitive image of the city is most sharply in focus for areas around his residential location. The clarity of the image decreases with increasing distance. In many respects mental maps are parallel to the concept of information possessed initially (Brown and Moore, 1970, p. 205). Both involve properties of distance-decay and tend to influence distance bias in moves.

Another set of variables which may be of impact in distance bias can be described as economic, social, and neighborhood affinities. It has been demonstrated that households tend to remain at a fairly constant economic level and that moves in response to changing economic needs are not common (Simmons, 1968). This has the effect of restricting most intra-urban moves within similar economic areas. The impact upon length of move is self-evident. Social affinities may be described in terms of the strength of social contacts a household has developed within a particular area. They may be instrumental in reducing the length of move if there exists a desire to maintain social contacts. This factor has generally been cited as effecting a resistance to movement (Moore, 1972, p. 10) but the extension suggested seems reasonable. Neighborhood affinity is the physical counterpart of social affinity. It is the degree to which a household has adapted to a particular neighborhood in terms of activity systems and patterns. For example, a move might be made within a short distance in order that children need not attend another school or that the household still be in reasonable proximity to its church. The impact of such factors can be expected to be more evident in the moves of specific segments of the population, especially those with mobility restrictions such as the elderly (Golant, 1972, p. 77).

In summary, it soon becomes evident that although there exists a number of possible explanations for distance bias the verification of hypotheses is of considerable difficulty. The principal reason that empirical substantiation is difficult derives from the nature of the explanatory variables. Such variables as opportunities,

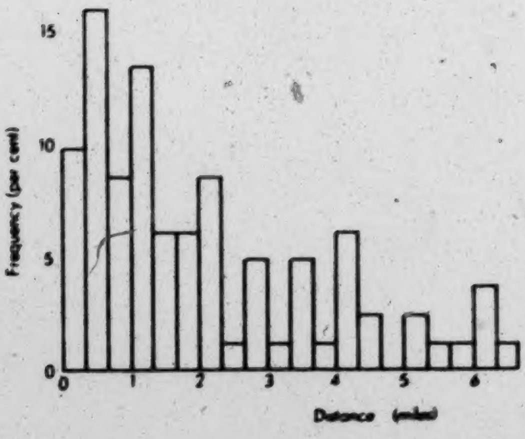
LENGTH OF MOVE



HOUSEHOLDS—CHILD-BEARING

Figure 22 SOURCE: HENDERSON'S DIRECTORIES AND THE EDMONTON JOURNAL

LENGTH OF MOVE



HOUSEHOLDS — WIDOWED

Figure 23 SOURCE: HENDERSON'S DIRECTORIES AND THE EDMONTON JOURNAL

information, search space, mental maps and perception are subjective in nature and their interpretation is always subject to question.

Analysis

Households - Child-bearing

Moves by length were distributed around the peak frequency of nine per cent for moves one and one-third to one and two-thirds miles in length. There was a general decline for both shorter and longer moves except for one group. Moves of less than one-third mile in length accounted for eight per cent of the total. This figure is about twice that which could be expected from the general trend (Figure 22). More than one-half of the moves were less than two and one-third miles in length and two-thirds were less than three and one-third miles in length (Table 12). There were no moves greater than nine and one-third miles in length.

Households - Widowed

More than one-third of the moves were less than one mile in length and more than two-thirds were under two and one-third miles (Table 12). The peak frequency was sixteen per cent, for moves one-third to two-thirds of a mile in length. The decline with increasing length was irregular to length of move four to four and one-third miles (Figure 23). There were no moves longer than six and two-thirds miles with twelve per cent of the moves being between four and one-third and six and two-thirds miles in length (Table 12).

Interpretation

Households - Child-bearing

By comparing move distances of households in the child-bearing

Table 12

LENGTH OF MOVE
HOUSEHOLDS - CHILD-BEARING AND WIDOWED

Length (1/3 miles)	Child-bearing		Widowed	
	#	%	#	%
0 - 1	11	7.7	8	9.8
1 - 2	5	3.5	13	16.0
2 - 3	9	6.3	7	8.5
3 - 4	8	5.6	11	13.4
4 - 5	13	9.0	5	6.1
5 - 6	11	7.7	5	6.1
6 - 7	10	7.0	7	8.5
7 - 8	9	6.3	1	1.2
8 - 9	7	4.9	4	4.9
9 - 10	6	4.2	1	1.2
10 - 11	6	4.2	4	4.9
11 - 12	6	4.2	1	1.2
12 - 13	4	2.8	5	6.1
13 - 14	5	3.5	2	2.4
14 - 15	5	3.5	0	0
15 - 16	3	2.1	2	2.4
16 - 17	3	2.1	1	1.2
17 - 18	1	0.7	1	1.2
18 - 19	5	3.5	3	3.7
19 - 20	3	2.1	1	1.2
20 - 21	2	1.4	0	0
21 - 22	1	0.7	0	0
22 - 23	3	2.1	0	0
23 - 24	3	2.1	0	0
24 - 25	0	0	0	0
25 - 26	2	1.4	0	0
26 - 27	0	0	0	0
27 - 28	2	1.4	0	0
Totals	143	100	82	100

Source: Henderson's Directories and the Edmonton Journal

stage to those of an aggregate population it may be seen that this group tended to make longer moves (Table 13). Relating this observation to this chapter's introductory discussion, the sub-population of households in the child-bearing stage may be differentiated from an aggregate population in terms of a number of factors. The pattern of move distances suggests that as a sub-population households in the child-bearing stage are less likely to relocate in the same neighborhood area than are most migrants. A number of reasons may be offered as explanations. Since the move made by a household in the child-bearing stage is likely to terminate in a location where the household will remain for some time (throughout the child-bearing and post-child stages) the selection of a location is of greater importance than a relatively temporary move as might be made by a single person. Therefore it is likely that search and evaluation in the relocation process will be more intensive and will be carried out in a larger area. From this it follows that there will exist relatively more opportunities at greater distances and the probability of a lengthier move will be increased. Secondly, with their children becoming increasingly more active in the surrounding area, a family may consider characteristics of the neighborhood as an important aspect in their relocation decision. Longer than average moves may imply a dissatisfaction with the neighborhood.

Length of residence has an impact on the strength of neighborhood social affinity which may influence the probability of moving to a different neighborhood. Since the pre-child and child-bearing periods are those of high mobility (Foote _et al_, 1960, p. 99), it may

Table 13

MOVE LENGTHS
AGGREGATE EDMONTON POPULATION (1971) AND FOR
HOUSEHOLDS - CHILD-BEARING AND WIDOWED

Distance (miles)	0 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8+
Aggregate Population	43.8	18.9	15.9	10.4	5.9	3.1	1.3	0.5	0.2
Households Child-bearing	17.5	22.3	18.2	12.6	9.8	4.9	7.0	4.9	2.8
Households Widowed	34.3	25.6	14.6	7.3	8.5	4.8	4.9	0	0

Source: Henderson's Directories and the Edmonton Journal, Aggregate Population figures adapted from McCracken (1973), Table 6, p. 56

be expected that length of residence in any one dwelling would be relatively short for a household in the child-bearing stage. There would not be sufficient opportunity to establish strong social ties with the neighborhood. A long move, involving a social as well as a spatial change, would not seem as undesirable as it may for those residing at one location for a long time.

The emphasis placed on selling single family detached dwellings by real estate agencies may also be an influence. The single family owned home is advertised to a greater extent than most other dwelling types. A greater exposure means that more opportunities would be known to the intended migrant thus increasing the possibility of a more distant move. A similar influence is generated by the greater dependence on real estate agents of persons buying a home. Agents make the migrant aware of a greater range of opportunities since they deal in a city-wide market. In general, those who wish to purchase a home have greater search spaces than those who wish to rent (McCracken, 1973, p. 160). Since ownership aspirations rank highly on the list of reasons for moving in the study questionnaire and since a large majority of the moves were to owned dwellings (Appendix 1), it may be assumed that this influenced the greater than average length of move for households in the child-bearing stage. The difference in move distances for households in the child-bearing stage and the aggregate population may therefore be seen as being influenced by the relative importance of the relocation which has impact on the areal extent of search space and the relatively greater importance placed upon neighborhood characteristics by households with small children.

Households - Widowed

As discussed in Chapter four, for a sub-population of households in the widowed stage there is no adequate descriptive surrogate variable. Age, a commonly used surrogate for life cycle stage, does not fully describe this particular stage of the life cycle. In view of this and the fact that widowed persons as a sub-population have not been the subject of empirical studies, the following discussion should be viewed in its proper context. That is, the analysis on which this discussion is based derives from data collected in one city at one point in time. Consequently, the following interpretation is that of an initial, exploratory study of intra-urban migration patterns of the recently widowed.

Move lengths of households in the widowed stage were generally similar to those of an aggregate population, as determined in another Edmonton study (McCracken, 1973). A similar proportion of each group made moves of less than three and less than two miles but, there was a nine and one-half per cent difference for moves of less than one mile. A greater proportion of the aggregate population made moves of less than one mile (Table 13). The general similarity may be influenced by the fact that a fairly wide range of ages may be included in the widowed group which would tend to make this group similar, in terms of age distribution, to the aggregate. The younger age groups would be misrepresented, which may account for the major difference in the frequency of moves less than one mile in length since many short distance moves are made by the young and highly mobile population in the middle and inner areas of the city. One and two person households, composed of younger persons, make moves within a more restricted area than do households with more members (Simmons and Baker, 1972). This sub-group's higher rate of mobility coupled with their more restricted movement can be expected to be of major influence in the aggregate distribution of move lengths. The absence of this group in the widowed sub-group suggests a lesser proportion of all moves being less than one mile in length.

A second factor which may influence the length of moves of widowed persons is that of the purpose of their relocation. Likely reasons for widowed persons relocating suggest that their moves will involve a major change of dwelling type and/or cost. The change may also be in terms of accessibility factors. The possibilities for realizing such changes within a short distance of the origin are less than at greater distances since housing type and costs tend to be similar within neighborhoods. With respect to accessibility, it is reasonable to argue that short moves are less likely to be those made for the purpose of improving accessibility to some place. Nevertheless, although widowed persons tended to make fewer moves of less than one mile in length than did the aggregate population the proportion of moves less than two miles in length was similar. The predominance of short distance moves in the sample of widowed persons may be a result of their restricted search space. With a large proportion of moves being made in the first year after being widowed, it may be expected that the search and evaluation process of this group was limited in temporal terms. It follows that within this time restriction only a limited number of alternative locations could be evaluated. The distance-decay characteristics prevalent in most aspects of the search process imply a spatial restriction as influenced by a temporal restriction. In summary, it is suggested that the move lengths of recently widowed households are influenced by a restriction of their search space and the requirements associated with a different type of housing.

DIRECTIONAL BIAS

Review

> Directional bias describes the degree to which a single migration is more likely to end in a place that is in a particular direction from the origin. (Brown and Holmes, 1971, p. 104)

Where length defines a circle of destinations, direction defines a line of destinations. This line originates in the centre of the circle and where it intersects the circumference of the circle defines the destination of the move (Figure 21). There are two basic ways in which direction may be defined. The move may be described as occurring in some compass direction such as to the north. On the other hand, the description may be in terms of some point other than the origin, the CBD for example. Thus, a move may be described as being away from, towards, or lateral to the CBD.

A frequently observed directional bias of intra-urban moves is the general outward movement away from the city centre. Causes of this trend include locational preferences, family life cycle, filtering, invasion-succession, and the housing market. Stouffer concluded from his analysis that on the average a location further from the city centre is likely to be more attractive than a similar location closer to the city centre (Stouffer, 1940). Wolpert attributed the unattractiveness of more central locations to noxious environmental factors. "Among those which have been most commonly suggested are: traffic congestion, blight, air and water pollution, lawlessness, lack of open spaces and noise levels." (Wolpert, 1965, p. 97). Similarly, Adams has argued that areas between the home neighborhood and downtown produce a negative reaction in the migrant whereas, " ... he and his family would consider a move [outward] as a step upward." (Adams, 1969, p. 305). These are observations of the overall trend and directional bias can be expected to vary for individuals or households adopting different life styles (Johnston, 1971, pp. 197 - 198).

Differentiating locational preferences has often been approached in terms of stages in the life cycle. A typical example is Abu Lughod and Foley's ascription of specific locational preferences at each stage of the family life cycle (Foote et al, 1960, p. 99). Similar comments frequently occur in the literature (Rossi, 1955; Simmons, 1968; Moore, 1972). As may be gleaned from previous work the general outward trend in terms of the life cycle is generated by family oriented households as they progress through the life cycle. Each successive stage is associated with locational requirements and preferences that influence an outward directional bias for moves generated by life cycle changes.

The process of filtering and invasion-succession also cause a general outward movement of households. A brief review of their impact is presented by Johnston (1968) who states that invasion-succession creates a " ... wave-like process in which households are always moving outward ..." (Johnston, 1968, p. 69) and that " ... there is a continual movement of households towards the urban periphery ..." (Johnston, 1968, p. 70) caused by filtering. These are aggregate effects and, as Johnston mentions, there exists anomalies which do not conform to the general pattern.

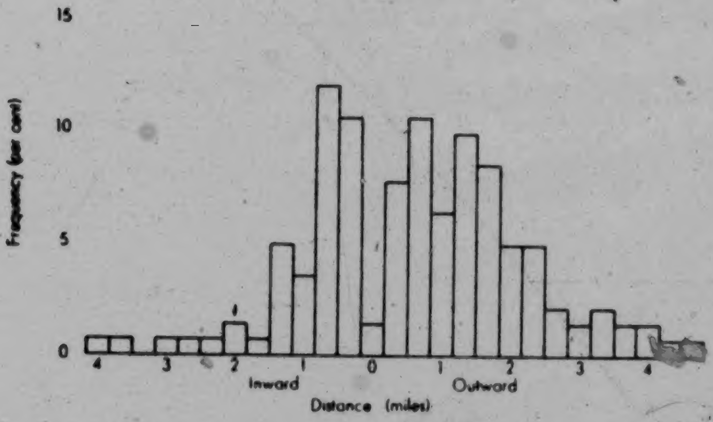
The supply of available housing has impact upon directional bias since moves can only terminate in areas where there exist vacancies. Furthermore, as Simmons states, " ... housing characteristics are more important than location factors in selecting a dwelling. The spatial distribution of housing of various kinds will affect the direction of flows." (Simmons, 1968, p. 405). A specific kind of housing will have direct impact upon a sub-population only. For example, an increasing number of centrally located apartments is unlikely to have impact upon the directional bias of moves made by families with young children whereas, the moves of single persons and childless couples may be influenced to a large degree. A number of variables influence the direction in which a move is made but, for specific household types some variables may be identified as being of greater impact. This is discussed following the analysis of data.

Analysis

Households - Child-bearing

About thirty-six per cent of all intra-urban moves by child-bearing households decreased the distance of household from the peak value intersection. Sixty-two per cent of these moves resulted in a change of less than two-thirds of a mile, and almost eighty per cent of all inward changes were less than one and one-third miles in length (Figure 24, Table 14). Two households did not alter their distance relative to the peak value intersection and sixty-two per cent increased this distance as a result of their intra-urban move. About two-thirds of the outward moves changed the distance less than one and two-thirds

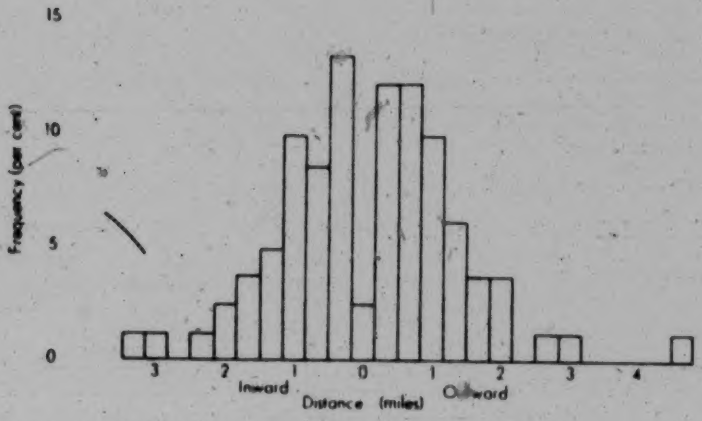
CHANGE IN DISTANCE FROM P.V.I.



HOUSEHOLDS — CHILD-BEARING

Figure 24 SOURCE HENDERSON'S DIRECTORIES AND THE EDMONTON JOURNAL

CHANGE IN DISTANCE FROM P.V.I.



HOUSEHOLDS—WIDOWED

Figure 25 SOURCE HENDERSON'S DIRECTORIES AND THE EDMONTON JOURNAL

Table 14

CHANGE IN DISTANCE FROM THE P.V.I. (Dd-Do)
HOUSEHOLDS - CHILD-BEARING AND WIDOWED

Distance (1/3 miles)	Child-bearing		Widowed	
Inward (Dd-Do negative)	#	%	#	%
11 - 12	1	0.7	0	0
10 - 11	1	0.7	0	0
9 - 10	0	0	1	1.2
8 - 9	1	0.7	1	1.2
7 - 88	1	0.7	0	0
6 - 7	1	0.7	1	1.2
5 - 6	2	1.4	2	2.4
4 - 5	1	0.7	3	3.7
3 - 4	7	4.9	4	4.9
2 - 3	5	3.5	8	9.8
1 - 2	17	11.9	7	8.5
0 - 1	15	10.5	11	13.4
Totals (inward)	52	36.4	38	46.3
NO CHANGE (Dd=Do)	2	1.4	2	2.4
Totals (outward)	89	62.2	42	51.2
Outward (Dd-Do positive)				
0 - 1	11	7.7	10	12.2
1 - 2	15	10.5	10	12.2
2 - 3	9	6.3	8	9.8
3 - 4	14	9.8	5	6.1
4 - 5	12	8.4	3	3.7
5 - 6	7	4.9	3	3.7
6 - 7	7	4.9	0	0
7 - 8	3	2.1	1	1.2
8 - 99	2	1.4	1	1.2
9 - 10	3	2.1	0	0
10 - 11	2	1.4	0	0
11 - 12	2	1.4	0	0
12 - 13	1	0.7	0	0
13 - 14	1	0.7	1	1.2
TOTALS	143	100	82	100

Source: Henderson's Directories and the Edmonton Journal

miles (Table 14). The extreme changes were three and two-thirds to four miles inward and four and one-third to four and two-thirds miles outward.

Households - Widowed

A similar number of households increased and decreased their relative distance from the peak value intersection by moving (Figure 25). Two households did not change their distance from the peak value intersection, forty-six per cent decreased and fifty-one per cent increased this distance. More than two-thirds of the moves resulted in an absolute change of less than one mile (Table 14). The range was three and one-third inward to four and two-thirds outward. If the three longest inward and outward moves are not considered, the range is reduced considerably to two miles inward and two miles outward. Ninety-three per cent of the moves resulted in absolute changes of less than two miles (Table 14).

Interpretation

Households - Child-bearing

The outward bias demonstrated in the analysis of data is principally explained in terms of three factors; dwelling size, tenure, and new home construction. The spatial variation of single family detached dwellings and apartments, outlined in Chapter four, may be interpreted as a spatial variation of average dwelling size. The inner areas, with a proportionately greater number of apartments, may be considered as being areas of small dwelling units as opposed to the outer areas where single family detached homes are more prevalent. There is, therefore, a direct relationship between distance from the CBD and dwelling size. Since the moves of households in the child-bearing stage were to larger dwellings it follows that these moves would be outwardly biased as was observed.

A similar case can be argued in terms of tenure. There exists a direct relationship between the proportion of owned dwellings and distance from the CBD. A large majority of moves made by households in the child-bearing stage were made to owned dwellings and ownership aspiration was a major reason for moving. From this it follows that moves to owned homes are more likely to be outward as was the case for this study's sample group of households in the child-bearing stage. Newly constructed homes in the outer areas of the city are predominantly single family detached dwellings. These are of the type to which households with children will move. The spatial location of a particular house type will therefore influence an outward bias in the moves of this particular sub-population. The propensity to outward movement for households with children has been outlined by Abu Lughod and Foley (Foote et al, 1960) and confirmed in a number of subsequent studies (Johnston, 1971; Moore, 1972; Simmons and Baker, 1971). This study's sample similarly supports the hypothesis that households with young children will have a high likelihood of outward movement.

Households - Widowed

Simmons (1968) and Adams (1969) have stated that death in a household may generate a move to a smaller dwelling, closer to the city centre. Within a dynamic urban system the processes of redevelopment and conversion to apartment units occur in an outward direction. By the time a household reaches the final, or widowhood stage, it is likely that the alternative dwelling units of smaller size are not located only towards the centre but surround the widowed home. Consequently, moves in response to decreased dwelling space requirements need not necessarily be inward.

Reduced income of the widowed household may necessitate a residential adjustment to a less expensive location. Simmons (1968, p. 407) has suggested that the housing cost isopleth moves outward in the city effecting an outward movement for households with constant income and constant housing needs. A reduced income may be expected to magnify the impact of increasing housing costs thus generating outward moves for widowed persons. It may be argued, however, that housing in central areas, although more expensive per unit of area, may be relatively less expensive than housing in outer areas since inner dwellings are much smaller. Therefore, a cost-reducing move might also be inward. Some widowed persons may move to the home of their children. No consistent directional bias can be assumed here since the children may be single, or members of a childless family and be located in the inner areas or, they may be in the child-bearing or child-rearing stages and located in the outer areas.

The observed pattern of inward and outward moves in this study suggests that there is no directional bias in moves of the recently widowed. This may be a reflection of the variety of reasons which may generate their relocations and the equally numerous factors which may enter into the relocation decision. The analysis suggests that direction is of little or no consequence in this sub-population's moves as compared with distance bias as discussed in the previous section. The relative unimportance of direction may be influenced by the availability of reasonable relocation alternatives throughout the inner and middle areas of the city for widowed persons. Since most of the sample was originally located in the middle areas it follows that their moves would not be restricted directionally as much as in terms of distance.

SECTORAL BIAS

Review

> Sectoral bias describes the degree to which a single migration is more likely to end in a place that is along a single axis through (or near) the origin. (Brown and Holmes, 1971, p. 104)

In the analysis of sectoral bias the basic concepts applied are those of socio-economic structure and mental maps. Both of these employ the sector in describing the spatial variation of variables. The basis for sectoral bias as influenced by socio-economic variables, is in the combined concepts of sectoral variation of socio-economic variables and the restriction of intra-urban moves within similar socio-economic areas. The former concept is as developed by Hoyt (1939) and the latter stems from findings with respect to the characteristics of origins and destinations of movers. In reviewing the relationship of mobility and change in economic status Simmons states "About eighty per cent of intra-city movement takes place within census tracts of the same class or adjacent classes." (Simmons, 1968, p. 400). It follows that most intra-urban movement will be restricted sectorally if socio-economic status does vary sectorally and Simmons' observations hold in general.

The sectoral mental map concept, as outlined by Adams (1969) states that an individual's mental image of the city will be sectoral in shape. The CBD is at the apex and the sector is centred on the individual's place of residence. From this it follows that information, search space, and personal contacts will vary in a fashion similar to the individual's mental map of the city. All these factors are related and depend upon the mental image and activity space of the individual. When a move is made there is a greater probability of it occurring in an area of familiarity, that is, within a sectoral area. Another explanation of sectoral bias is one which describes it as a residual phenomenon, occurring because of the bias of moves relative to the CBD. Housing varies concentrically and many moves are in response to changing housing requirements. It follows that these moves will occur inward or outward rather than in a lateral fashion. This would have the effect of biasing moves in a manner which could be described as sectoral, although the spatial nature of the moves is influenced by a concentric variation of housing types. Little evidence is offered by this study of sectoral bias in moves, as may be seen in the following analysis.

Analysis - Angle at CBD

The value of the angle at the CBD as determined by an intra-urban move describes the location of the destination relative to an axis drawn through the origin and the CBD. Two factors influence this value, the length of move (short moves produce small angles) and the direction of move relative to the origin-CBD axis. Therefore, any distribution of angles at the CBD will be determined by these two factors.

Households - Child-bearing

The peak frequency in the distribution for child-bearing households occurred for angles of less than ten degrees. Almost twenty-two per cent of the moves generated angles of less than ten degrees and sixty-three per cent were less than fifty degrees. For each ten degree interval greater than fifty degrees the frequency remained relatively stable, varying between six and one per cent (Table 15, Figure 26). This distribution suggests that the moves were short and/or in the direction of an origin-CBD axis.

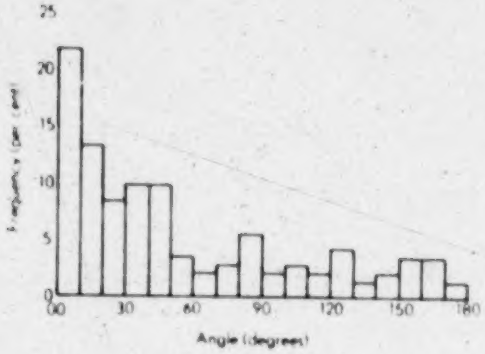
Households - Widowed

For widowed households there was a similar distribution of move angles at the CBD. In this sample, however, thirty-three per cent of the moves were less than ten degrees and eleven per cent were ten to twenty degrees. For each ten degree interval greater than twenty but less than one hundred and ten degrees the frequency varied between seven and two per cent. Changes greater than one hundred and ten degrees accounted for only twelve per cent of all moves (Table 15, Figure 27). As was mentioned in the previous case, the moves of widowed households were short and/or in the direction of an origin-CBD axis, as is suggested by the distribution of move angles at the CBD.

Analysis - Angle at Origin

The value of an angle at the origin as produced by an intra-urban move indicates the direction, relative to an origin-CBD axis, in which the move occurred. Angles near zero indicate moves made along or near the origin-CBD axis. Angles near ninety degrees indicate moves made in a direction perpendicular to the origin-CBD axis. This angular measure, unlike the angle at the CBD, is not influenced by the length of move but is solely effected by the direction in which the move occurs.

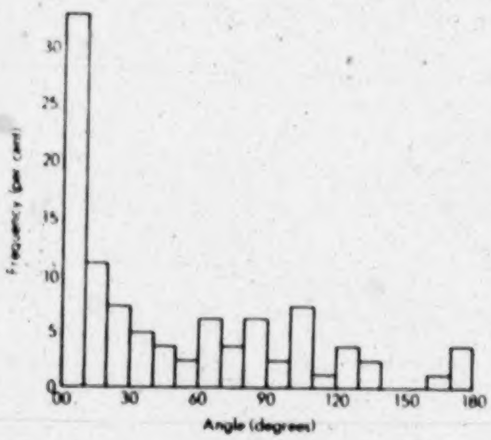
ANGLE OF MOVE AT P V I



HOUSEHOLDS – CHILD-BEARING

Figure 26 SOURCE HENDERSON'S DIRECTORIES AND THE EDMONTON JOURNAL

ANGLE OF MOVE AT P V I



HOUSEHOLDS – WIDOWED

Figure 27 SOURCE HENDERSON'S DIRECTORIES AND THE EDMONTON JOURNAL

Table 15

ABSOLUTE CHANGE IN ANGLE AT THE P.V.I.
HOUSEHOLDS - CHILD-BEARING AND WIDOWED

Angle (degrees)	Child-bearing		Widowed	
	#	%	#	%
0 - 10	31	21.7	27	32.9
10 - 20	19	13.3	9	11.0
20 - 30	12	8.4	6	7.3
30 - 40	14	9.8	4	4.9
40 - 50	14	9.8	3	3.7
50 - 60	5	3.5	2	2.4
60 - 70	3	2.1	5	6.1
70 - 80	4	2.8	3	3.7
80 - 90	8	5.6	5	6.1
90 - 100	3	2.1	2	2.4
100 - 110	4	2.8	6	7.3
110 - 120	3	2.1	1	1.2
120 - 130	6	4.2	3	3.7
130 - 140	2	1.4	2	2.4
140 - 150	3	2.1	0	0
150 - 160	5	3.5	0	0
160 - 170	5	3.5	1	1.2
170 - 180	2	1.4	3	3.7
Totals	143	100	82	100

Source: Henderson's Directories and the Edmonton Journal

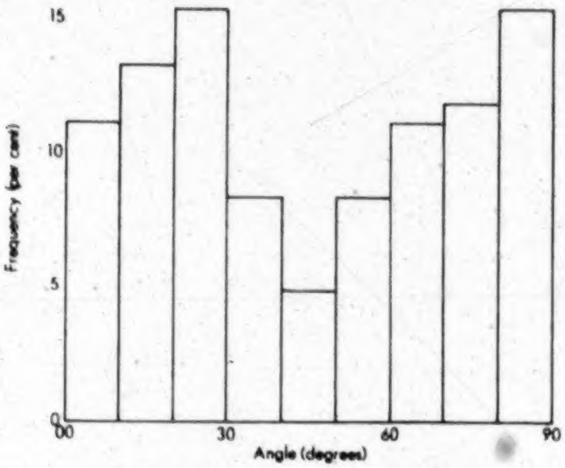
Households - Child-bearing

The distribution for child-bearing households was bi-modal with values of twenty to thirty degrees and eighty to ninety degrees each accounting for over fifteen per cent of all moves. The lowest frequency of five per cent occurred for values of forty to fifty degrees. If the nine classes are aggregated into three groups the zero to thirty degree group represents forty per cent, the thirty to sixty degree group represents twenty-two per cent, and the sixty to ninety degree group represents thirty-nine per cent (Table 16, Figure 28). The nature of the distribution suggests that there was no bias with respect to moves being made in one particular direction from an origin-CBD axis.

Households - Widowed

The distribution for widowed households was irregular with two high frequencies of eighteen and seventeen per cent for values of twenty to thirty degrees and fifty to sixty degrees respectively. Two low frequencies of six per cent occurred at values of forty to fifty degrees and sixty to seventy degrees. If aggregated into three groups, the distribution declines from a high of forty-four per cent for values of zero to thirty degrees to thirty-four per cent for thirty to sixty degrees and then to twenty-two per cent for sixty to ninety degrees (Table 16, Figure 29). The aggregately grouped distribution suggests that there was a tendency for moves to occur more along an origin-CBD axis than perpendicular to it. The distribution of frequencies by ten degree intervals, however, is less indicative of such a trend.

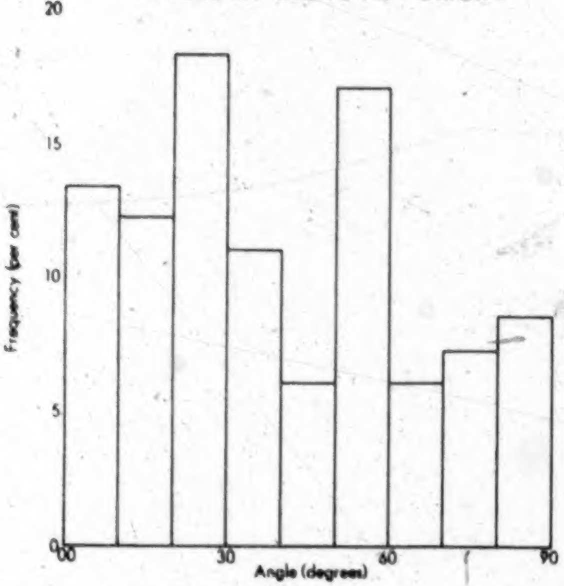
ANGLE OF MOVE AT ORIGIN



HOUSEHOLDS — CHILD-BEARING

Figure 28 SOURCE: HENDERSON'S DIRECTORIES AND THE EDMONTON JOURNAL

ANGLE OF MOVE AT ORIGIN



HOUSEHOLDS — WIDOWED

Figure 29 SOURCE: HENDERSON'S DIRECTORIES AND THE EDMONTON JOURNAL

Table 16

ANGLE OF MOVE AT ORIGIN
HOUSEHOLDS - CHILD-BEARING AND WIDOWED

Angle (degrees)	Child-bearing #	%	Widowed #	%
0 - 10	16	11.2	11	13.4
10 - 20	19	13.3	10	12.2
20 - 30	22	15.4	15	18.3
30 - 40	12	8.4	9	11.0
40 - 50	7	4.9	5	6.1
50 - 60	12	8.4	14	17.1
60 - 70	16	11.2	5	6.1
70 - 80	17	11.9	6	7.3
80 - 90	22	15.4	7	8.6
Totals	143	100	82	100

Source: Henderson's Directories and the Edmonton Journal

Interpretation

Households - Child-bearing

The analysis of data indicates that there exists an element of sectoral bias in moves made by child-bearing households. The principal reason for this, however, does not appear to be either the influence of socio-economic structure of the city or that of restricted mental images. As was reviewed earlier in this chapter, sectoral bias may be described as a derivative of distance and directional bias. When length of move is correlated with angle of move at the PVI it is evident that the principal explanatory factor for this observed sectoral bias is that of move length. The correlation coefficient was 0.863 which means that seventy-four per cent of the distribution of angle of move at the PVI is explained by move length. That is, short moves produce small angles and longer moves produce larger angles.

The second method of analysis by angle of move at origin, is independent of move length and thus provides an ultimate test of sectoral bias where the influence of move length is eliminated. The correlation of move length and angle of move at origin was -0.233. The observed distribution of angles of move at origin for this study suggests that there is no significant element of sectoral bias and that moves were equally likely to occur perpendicular to as well as along an axis through the origin and CBD. The existence of sectoral bias in terms of angle at the PVI is apparent in the moves made by this particular sub-population mainly as a consequence of move length. The impact of socio-economic structure and mental maps is therefore considered insignificant in influencing sectoral bias in this study.

Households - Widowed

Sectoral bias in this sample of moves is very evident yet, as with the previous sample, the distribution of angle of move at the PVI is principally explained by move length. Length of move and angle of move at the PVI were correlated and the coefficient is 0.846 which means that seventy-one per cent of the explanation for sectoral bias in terms of angle of move at the PVI is provided by move length. Here, as before, short moves produce small angles and longer moves produce larger angles.

The angle of move at origin, which was largely independent of move length, does suggest that there exists some element of sectoral bias for this sub-population not caused by move length alone. Apart from the two highest frequencies of angles twenty to thirty and fifty to sixty degrees, there appears to be a general decay function in this distribution with a greater probability for a move to be made along an origin-CBD axis rather than perpendicular to it. The value of the angle of move at origin was largely independent of the other spatial factors examined. The location of origin and destination, the direction of move, length of move and angle of move at the PVI each provided less than six per cent explanation.

For households in the widowed stage, there is the possibility of spatial bias as influenced by socio-economic factors and/or mental maps. Socio-economic factors may be of influence since it may be expected that a widowed person is unlikely to alter either social or economic status. As discussed in Chapter four, most of this sample may be expected to have been in the latter stages of the life cycle prior to widowhood. In these latter stages it is less likely for the household to experience any social or economic changes except for a decrease in household income as the result of the death of a wage earner. Mental maps may also provide some explanation for the sectoral bias since it may be expected that this particular sub-population is generally older and is less mobile. Their personal contact with areas of the city would be more restricted spatially than that of younger more mobile persons. Length of residence, a factor of influence in the strength of mental images, may be expected to be greater than average for this group since most of the households are expected to be in the latter stages of the life cycle, those characterized by low mobility rates. These two factors, socio-economic structure and mental maps, provide some explanation for the weak, yet discernable element of sectoral bias in their angle of move at the origin.

CHAPTER VI

SPATIAL PATTERNS OF DESTINATIONS

Within the framework outlined in Chapter one, where moves were assumed to terminate at a place of relatively greater utility for the migrant household, locations of destinations represent areas of improved place utility relative to the origin. Since a move terminates at some specific location, this location is of maximum utility for the migrant household at the time of move with respect to all other locations in the city. By examining the patterns of destinations it may be determined whether moves terminate in certain areas more frequently than in others. If there exists such a basis for differentiation then those areas of frequent destinations may be assumed to represent a location of high place utility for the migrant. Conversely, those areas with infrequent destinations may be assumed as areas of low place utility. This chapter contains an analysis of the location of destinations of the sample population and a subsequent discussion of the results with reference to the literature reviewed in Chapters four and five.

Analysis

Households - Child-bearing

More than ninety per cent of the destinations were located more than two and one-third miles from the peak value intersection and more than two-thirds were at a distance greater than three and one-third miles (Table 17). The distribution ranged from one-third to five and

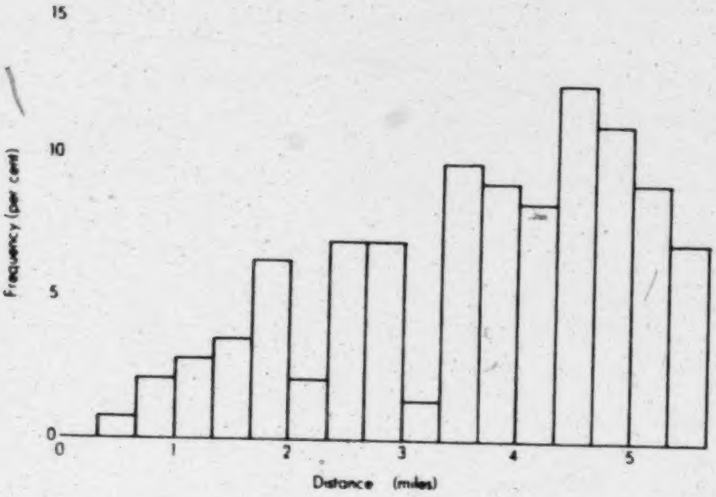
Table 17

LOCATION OF DESTINATIONS BY DISTANCE FROM THE P.V.I. HOUSEHOLDS - CHILD-BEARING AND WIDOWED

Distance (1/3 miles)	Child-bearing		Widowed	
	#	%	#	%
1 - 2	1	0.7	2	2.4
2 - 3	3	2.1	10	12.2
3 - 4	4	2.8	4	4.9
4 - 5	5	3.5	9	11.0
5 - 6	9	6.3	7	8.5
6 - 7	3	2.1	9	11.0
7 - 8	10	7.0	4	4.9
8 - 9	10	7.0	8	9.8
9 - 10	2	1.4	6	7.3
10 - 11	14	9.8	7	8.5
11 - 12	13	9.1	6	7.3
12 - 13	12	8.4	4	4.9
13 - 14	18	12.6	3	3.7
14 - 15	16	11.2	0	0
15 - 16	13	9.1	0	0
16 - 17	10	7.0	3	3.7
Totals	143	100	82	100

Source: Henderson's Directories and the Edmonton Journal

DISTRIBUTION OF DESTINATIONS
BY DISTANCE FROM THE P.V.I.



HOUSEHOLDS – CHILD-BEARING

Figure 30 SOURCE: HENDERSON'S DIRECTORIES AND THE EDMONTON JOURNAL

two-thirds miles from the city centre with the peak frequency of eighteen households, or thirteen per cent, in the areas four and one-third to four and two-thirds miles from the peak value intersection. About forty per cent of the destinations were more than four and one-third miles from the city centre. The trend was for increasing frequencies from one-third to four and one-third miles from the city centre and a decline to five and two-thirds miles. Two areas were much lower than would be expected from this trend. Areas two to two and one-third miles and three to three and one-third miles contained only two and one and one-half per cent of the households respectively (Table 17, Figure 30). The angular distribution is strongly oriented to the north north-east and south south-west. Two, thirty degree sectors in these areas contain twenty-two and twenty per cent of the destinations respectively. They represent about seventeen per cent of the area but contain forty-two per cent of the destinations. Two areas were under-represented, one in the north north-west and one in the south-east. All other areas varied from one-half to three and one-half per cent in frequency (Table 18, Figure 31).

Households - Widowed

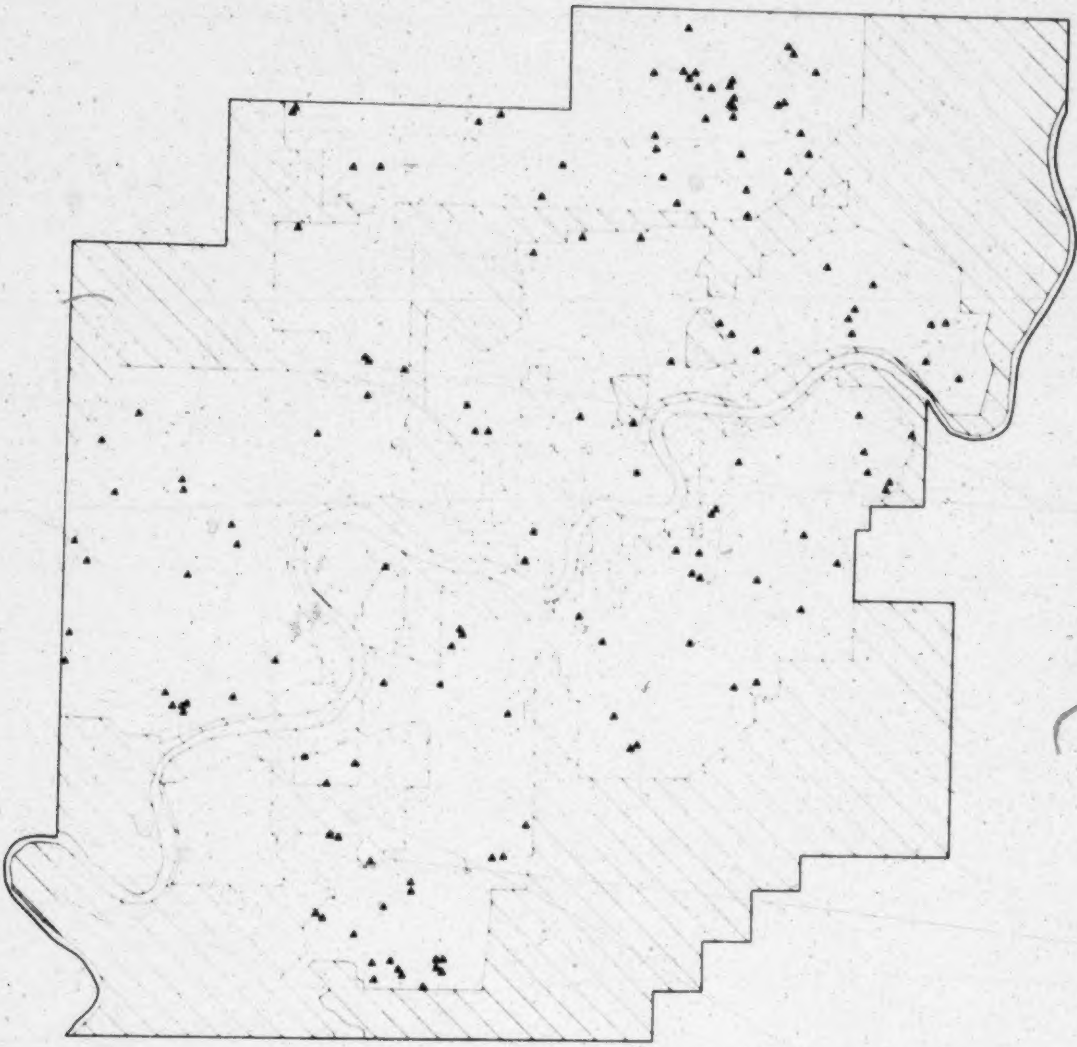
One-half of the destinations were within two and one-third miles of the city centre. The highest frequency, twelve per cent, occurred in the areas two-thirds to one mile from the peak value intersection and there was a general decline with increasing distance. Two and one-half per cent of the households were within one-third to two-thirds miles of the city centre. Three areas differed from the general pattern of decline from the two-thirds to one mile area. The one to one and one-third and two and one-third to two and two-thirds mile zones had

Table 18

LOCATION OF DESTINATIONS BY ANGLE OF DESTINATION
HOUSEHOLDS - CHILD-BEARING AND WIDOWED

Angle (degrees)	Child-bearing		Widowed	
	#	%	#	%
0 - 10	3	2.1	1	1.2
10 - 20	2	1.4	6	7.3
20 - 30	1	0.7	2	2.4
30 - 40	4	2.8	3	3.7
40 - 50	3	2.1	3	3.7
50 - 60	4	2.8	3	3.7
60 - 70	1	0.7	0	0
70 - 80	1	0.7	6	7.3
80 - 90	3	2.1	4	4.9
90 - 100	2	1.4	6	7.3
100 - 110	12	8.4	3	3.7
110 - 120	13	9.1	2	2.4
120 - 130	7	4.9	1	1.2
130 - 140	4	2.8	4	4.9
140 - 150	5	3.5	4	4.9
150 - 160	2	1.4	0	0
160 - 170	5	3.5	1	1.2
170 - 180	4	2.8	2	2.4
180 - 190	3	2.1	1	1.2
190 - 200	2	1.4	0	0
200 - 210	5	3.5	2	2.4
210 - 220	0	0	2	2.4
220 - 230	3	2.1	0	0
230 - 240	0	0	3	3.7
240 - 250	0	0	0	0
250 - 260	5	3.5	1	1.2
260 - 270	0	0	1	1.2
270 - 280	3	2.1	1	1.2
280 - 290	12	8.4	3	3.7
290 - 300	7	4.9	3	3.7
300 - 310	9	6.3	1	1.2
310 - 320	2	1.4	0	0
320 - 330	5	3.5	0	0
330 - 340	3	2.1	3	3.7
340 - 350	3	2.1	4	4.9
350 - 360	5	3.5	6	7.3
Totals	143	100	82	100

Source: Henderson's Directories and the Edmonton Journal



FIRST DESTINATIONS HOUSEHOLDS - CHILD-BEARING
INTRA-URBAN MOVERS

Figure 31

Source: Henderson's Directories and The Edmonton Journal

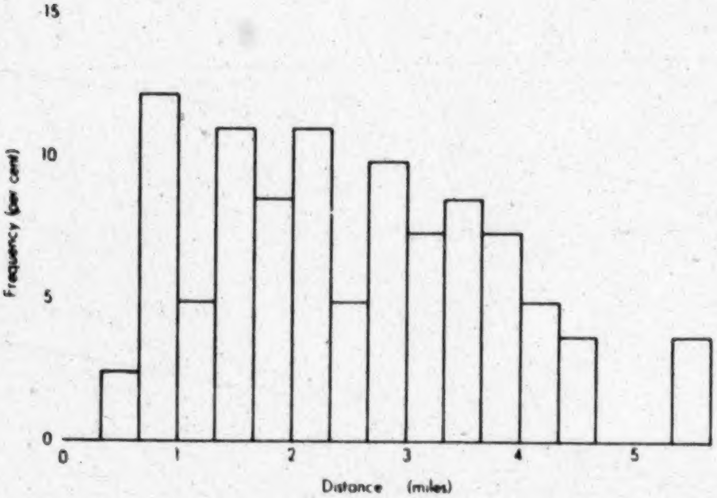
about one-half of the households that could be expected from the general trend. The five and one-third to five and two-thirds mile zone had a greater frequency than might be expected since there were no destinations between four and two-thirds and five and one-third miles from the city centre (Table 17, Figure 32). Destinations showed a north and west bias. Less than one-half of the area (330 - 150 degrees) contained more than two-thirds of the destinations. The southern half generally contained fewer destinations with some obvious gaps in the south-west and south-east (Table 18, Figure 33).

Interpretation

Households - Child-bearing

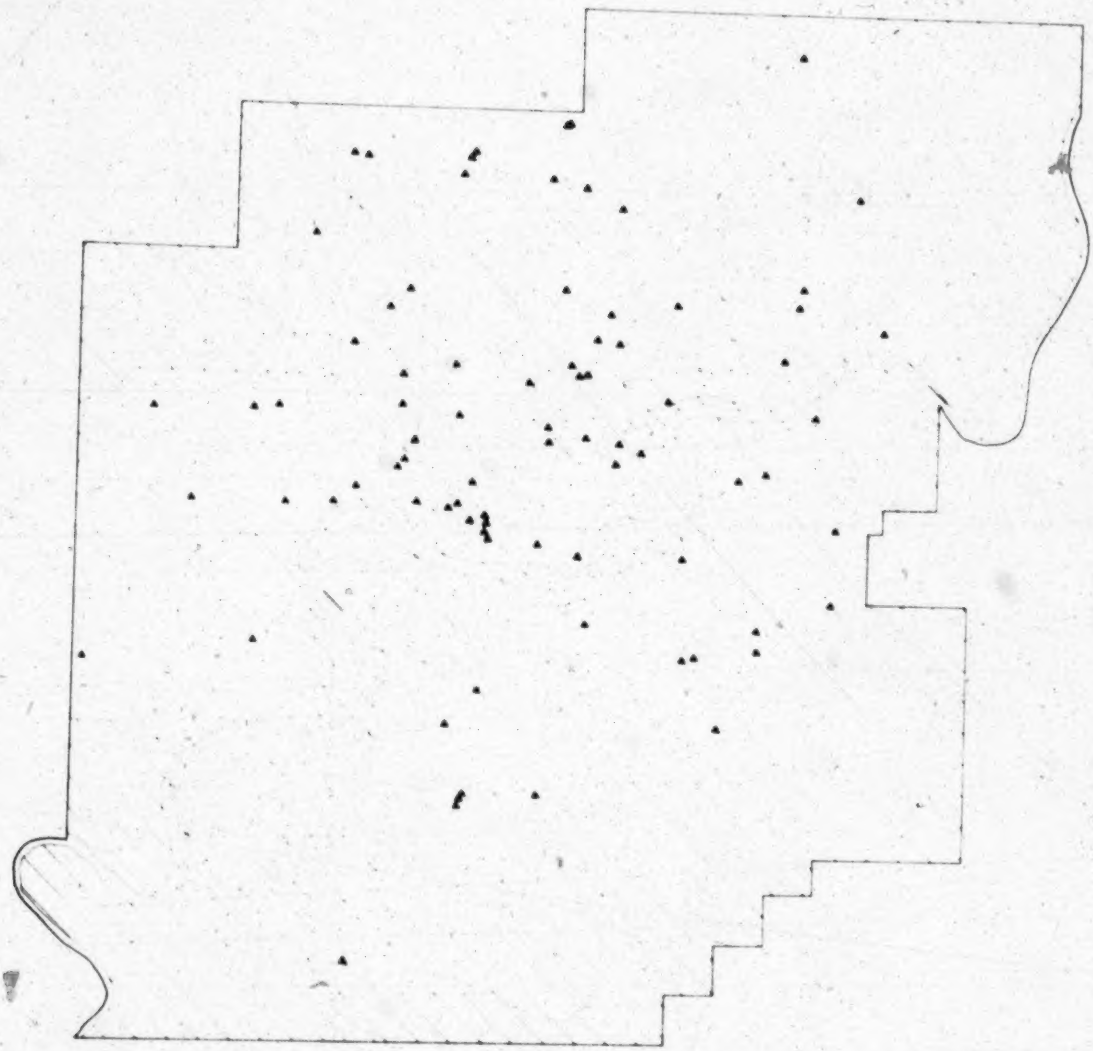
For this sub-population moves terminated most frequently in the outer areas of the city and, more specifically, in the north-east and south-west outer areas. Factors influencing this pattern were discussed in the previous chapter. The size of dwellings and the neighborhood environment appear to be the most important factors because of increasing family size and the presence of young children. New single family detached homes, available for purchase, are most prevalent in outer areas. In Edmonton the areas to the north-east and south-west were the sites of intensive construction of this sort throughout the study period. Thus, the household characteristics determine to what type of dwelling unit the migrant will relocate and the distribution of these dwellings determines the spatial nature of these moves. Thus the distribution of available alternatives (vacancies) of a specific type of dwelling unit was a primary influence in the pattern of destinations as observed in this study.

DISTRIBUTION OF DESTINATIONS
BY DISTANCE FROM THE P.V.I.



HOUSEHOLDS – WIDOWED

Figure 32 SOURCE: HENDERSON'S DIRECTORIES AND THE EDMONTON JOURNAL



FIRST DESTINATIONS HOUSEHOLDS - WIDOWED
INTRA-URBAN MOVERS

▨ Areas Principally Non-Residential

0 1 2 miles

Figure 33 Source: Henderson's Directories and The Edmonton Journal

Households - Widowed

The absence of areas of frequent destinations for recently widowed migrants may be a reflection of the lack of common residential requirements.of this sub-population. As was suggested in the discussion of directional bias in Chapter five, there may not exist any particular spatial pattern of relocation alternatives for this sub-population. Although widowhood has been shown to have an influence upon the propensity to move it may have little impact upon the spatial aspects of the relocation. Other factors, characteristic of the recently widowed but not necessarily of importance for the majority of these households, may be of greater influence. Factors such as the presence or absence of children, age of the widowed person, economic considerations and personal preference may be of impact at the individual level but not in general.

CHAPTER VII

LIFE CYCLE, PLACE UTILITY, AND INTRA-URBAN MOBILITY

As was outlined in Chapter one, the research problem of this thesis centred on the relationship between household structure (life cycle), residential requirements or aspirations (place utility), and intra-urban residential relocations (mobility). Chapters two through six presented an analysis and interpretation of temporal and spatial aspects of the sample populations' mobility behavior and patterns. In this chapter the findings are discussed in a more general sense. Individual interpretations and conclusions of the preceding are brought together in a summary of the principal findings.

Household Structure and Mobility Rates

One of the principal findings of this study was that there exists an association between mobility rates and a change in household structure. In Chapter two it was shown that for households in the child-bearing stage high rates of mobility occur for two years following the birth of a child. Similarly, for recently widowed persons highest rates of mobility occur in the year after widowhood. It was then shown that the association between change in household structure and high rates of mobility could be interpreted as a three part relationship with residential requirements (place utility) as an intermediate variable. That is, a change in household structure does not itself have direct influence on mobility rates but, a change in household structure causes a change in residential requirements and these have an influence upon mobility.

As households progress through the life cycle their structure and composition are altered. These changes in household structure cause a change in some household requirements and some new requirements may be formed by altered household structure. A sub-set of all household requirements are those which are related to the place of residence, that is, residential requirements. This relationship is reflected in the variety of dwellings, their style, size, cost and location, which is required to meet the diverse demands of an aggregate population. From this relationship between household structure and household requirements, it follows that times of change in household structure will be those of changing residential requirements.

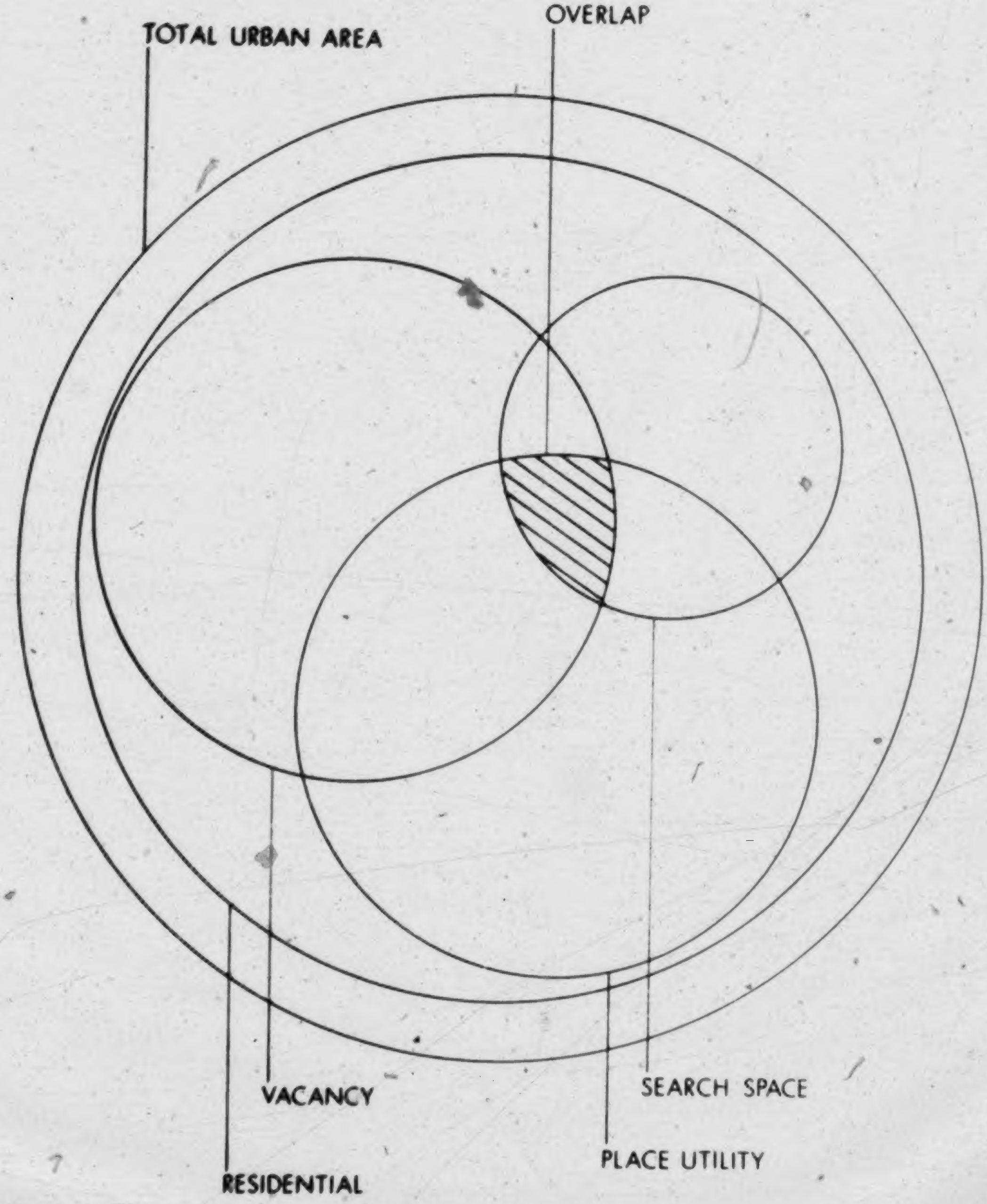
As reviewed in Chapter one, the decision to move is initiated by a perceived disutility with respect to place of residence. The intended migrant household finds that its residential requirements are not satisfied to a sufficient degree by its residential location. From this it may be seen that a change in residential requirements is likely to create a disparity between actual and required characteristics of residence. For example, it may be assumed that at some point in time a household resides in a place where their residential requirements are satisfied. A change in residential requirements is more likely to cause a disparity between actual and required characteristics of residence than would be the case with no change in residential requirements. Thus, periods of changing requirements will be those of increased propensity to move. Furthermore, since periods of changing requirements are those of changing household structure, an increased propensity to move is associated with a change in household structure. This association is borne out in this study's analysis of empirical data. The above relationship is summarized in the following model. Household structure is represented by "S", residential requirements are represented by "R", and residential location is represented by "L". A change in either of these variables is represented by "*". Different points in time are represented by "t1" to "t4".

L		L		L	*	L'
R		R	*	R'		R'
S	*	S'		S'		S'
t1		t2		t3		t4

At time t1 the household is located where its residential requirements are met by the residence. At time t2 the structure of the household is altered which causes a change in residential requirements at time t3. At time t3 there exists a state of stress with respect to actual and required residential characteristics. This situation influences a change in residential location and at time t4 the household is once more located where its residential requirements are met by the residence.

Household Structure and Mobility Patterns

A second major finding of this study was that households at different stages of the life cycle have different patterns of intra-urban moves. This was interpreted in terms of different residential requirements and the distribution of various dwelling types. Destinations of intra-urban migrants must occur in the urban area within the overlap of four individual areas. These are, residential, search space, vacancy, and place utility (Figure 34). It is evident that a move cannot terminate beyond a residential area, outside of the search space or in an area with no vacancies. Residential and vacancy space are a function of the housing market and independent of household structure. Search space, apparently a function of tenure and especially destination tenure (McCracken, 1973), appears not to be influenced by household structure. This may be due to the fact that search space is dependent upon the availability of information and the information initially possessed by the intended migrant (Brown and Moore, 1970) and not on stage in life cycle. The place utility area, that space within which there exists dwellings of suitable type and within the economic range of the migrant, however, is largely a function of household structure. This relationship derives from the relationship of household structure and residential requirements as discussed earlier in this chapter. Household structure defines a set of residential requirements and this set of requirements defines a space within which these requirements may be satisfied. Thus household structure, a factor of influence in residential requirements, has impact upon place utility space and consequently influences patterns of moves. It may be seen that at one specific time residential and vacancy space will be the same for all intended migrants. The difference in observed patterns is a result of the differences in search space and acceptable place utility space. The migrant's information seeking behavior defines the search space and residential requirements and aspirations, a function



AREAL LIMITS OF MOVE DESTINATIONS

Figure 34

of household structure, define the acceptable place utility space.

In this study, the two sub-populations exhibited different patterns of mobility. It is concluded that since residential and vacancy space were the same for both the differences were influenced by differing search and acceptable place utility spaces. Since the two samples were differentiated on the basis of household structure it is suggested that their residential requirements were different. This implies that acceptable place utility space was the major factor of influence in the observed pattern of moves. The general conclusion of this study is that household structure, through its influence on residential requirements and acceptable place utility space, is a major factor in determining the patterns of intra-urban moves, as observed in this study.

Framework for Future Research

This thesis illustrates that a number of different variables must be examined individually in repeated empirical studies if the complexity of intra-urban mobility patterns is to be understood. The most promising approach is one at a micro-level. From a series of conclusions at the micro-level a more complex model of intra-urban mobility might be constructed and the seemingly incomprehensible maze of intra-urban moves may be better understood. In this section the research framework is outlined which is intended to place this study in a more general theoretical framework and provide a basis for micro-level studies as suggested.

The research framework presented is designed to provide a methodology of systematic empirical testing of the relationship between household structure, residential requirements and intra-urban mobility. Assuming that residential location is some function of residential requirements it may be postulated that a change in residential requirements will effect a change in residential location. This proposition must be tempered somewhat since it is evident that a threshold must be exceeded before a major adjustment such as an intra-urban move is resorted to in order to meet residential requirements. The disutility effected by a change in requirements must be perceived as exceeding the disutilities involved in relocating before a decision to move is initiated (Wolpert, 1965, Brown and Moore, 1970, McCracken, 1973). Although a change in requirements does not necessarily effect a relocation the converse hypothesis can be accepted as being more feasible. If a relocation takes place there has occurred a change in residential requirements, a change in characteristics of residential location, or the move was involuntary. In view of a recent study of mobility in Edmonton (McCracken, 1973) the latter alternative may be discounted as being insignificant and by limiting the study period the probability of the second alternative occurring can be minimized. Consequently, the assumption reduces to; if a relocation takes place there has occurred a change in residential requirements. This concept is represented in the following model.

L		L	*	L'
R	*	R'		R'
equilibrium		stress-strain		equilibrium
t1		t2		t3

Thus, it may be hypothesized that there exists a causal relationship. That is, the change in residential location (*L) is some function of the change in residential requirements (*R).

$$*L = f(*R)$$

A similar argument may be used to describe the relationship of household requirements and change in household structure. As has been mentioned throughout this study, a change in household structure produces a change in total household requirements.

R		R	*	R'
S	*	S'		S'
equilibrium		stress-strain		equilibrium
t1		t2		t3

The change in residential requirements (*R) is some function of the change in household structure (*S).

$$*R = f(*S)$$

Combining the two relationships, *L = f(*R) and *R = f(*S) it can be assumed that change in residential location is some function of change in household structure.

$$*L = f'(*S)$$

The relationship of the three variables (L, R, S) was expressed earlier in this chapter. Within this framework a population may be selected on the basis of some *S. The characteristics of L and L' for each household determine *L which can then be examined as a function of *S. In order to bypass the indentification of *R, a subjective and often difficult to determine variable, it is assumed that the same *S will produce similar *R for similar households and that *L will reflect *R. This was expressed earlier in the relationship *L = f'(*S). This concept is useful since a micro-level approach, focusing on the relationship of one particular *S and one aspect of *L, can be adopted. For example, it may be hypothesized that a change in household income causes requirements which bear on the cost of housing. The sample population would be selected on the basis of having experienced a change in household income. Cost of housing at the residential locations prior to and after the change would determine the change in housing costs for each sample household. Subsequently, the two variables could be analyzed in order to determine whether some relationship exists and to establish the validity of the original hypothesis. Variations of the method include testing the relationship of one particular *L and several *S in order to determine relative impact of specific *S on that *L. Conversely, one *S can be tested with various *L in order to examine the area of greatest relative impact.

This study's population sample and data on spatial aspects of relocations are incorporated in the conceptual framework as described above. In this particular case, *S for the child-bearing household group represents the addition of one family member, an increase in size. For the widowed household group, *S represents a decrease in household size. It is evident that there are numerous other structural changes associated with the basic ones mentioned. In the child-bearing group there will occur changes in budget allocation as a result of the increase in household membership. This may have impact upon housing expenditures. Also, the residential requirements of a young child are different from those of other members of the household with respect to such residential characteristics as neighborhood. For the widowed household it may be assumed that in addition to a decrease in household size there are experienced changes such as decrease in income or a decreased physical capability for maintenance of a dwelling. Therefore, more comprehensively, *S for child-bearing households includes the addition of a new member and all related changes. Similarly, for widowed households, *S includes all changes associated with widowhood. The principal characteristics of residence analyzed in this study are the location of residence prior to *S with respect to the total urban area and the location of residence after *S with respect to the total urban area and with respect to the location prior to *S.

Within this study, three aspects of change in spatial location were analyzed under the headings of distance bias, directional bias, and sectoral bias. These may be interpreted as changes of the type *L as described in the model. Directional bias refers to the change in location with respect to the CBD. Distance and sectoral bias, since they are highly correlated, may be used in conjunction to describe the change in location with respect to the original residence. Denoting distance bias and sectoral bias as indicators of neighborhood change (*Ln) and directional bias as an indicator of change with respect to the CBD (*Lc), and the structural changes associated with child-bearing and widowhood as *Sc and *Sw, it can be seen from the results of the analysis that *Sc and *Sw are associated with different *Ln and *Lc. This lends credence to the utility of the proposed model since it may be assumed that, indeed, *L = f'(*S). The effect of *Sw on *Ln is that of restriction. Moves tend to occur within a familiar area. For *Sc this is less so. The affect of *Sw on *Lc is neutral since about an equal number of moves occurred outward as inward. There is though, some impact on *Lc by *Sc since, as observed, the majority of moves were outward and those that were inward were relatively short.

Another manner in which the model may be applied involves the analysis of a specific *L for an aggregate population. From this aggregate analysis a sub-population may be extracted for which there exists a distinct bias in *L. This sub-population may then be examined for some common *S. If such an *S can be delimited then there can be hypothesized a relationship of the nature *L = f'(*S). Further testing would involve selecting a population on the basis of *S to see if the impact on *L was consistent for different sub-populations characterized by *S. For example, from a total population extract a sub-population whose moves are directionally biased inward. Analyse the sub-population for common changes in household structure. If there are some such changes, select another sub-population on the basis of this *S and test for inward directional bias. If after repeated empirical tests the results indicate that the *S produces a sub-population characterized by *L there may be assumed a relationship of the form *L = f'(*S). In this manner a number of *S may be determined and ranked with respect to their relative impact upon *L. After repeated tests using various *S and *L a matrix might be constructed of n rows representing *S and m columns representing *L. Each cell would contain a value representing the relative impact of one specific *S on one specific *L. For example, for the cell *Sc*Ls, Representing the impact of an increase in family size on relocation to a larger dwelling, the value would be high. Conversely, for *Sw*Ls, representing the impact of widowhood on relocation to a larger dwelling, the value would be low. Values entered in the cells might be probabilities of *L occurring given *S. For example, *Sw*Lc would have a value of about 0.5 where the cell represents the probability of a widowed household moving outward. As was observed in the analysis about one-half of the moves were outward. For cell *Sc*Lc, child-bearing households and outward movement, the value would be 0.73 since 104 of 143 moves were outward.

A hypothesis may be constructed for *S'f, representing transition through the life cycle and *Lc, the probability of outward movement. In the family formation stage the probability would be low, increasing as the family progressed to the child-rearing stage. After this the probability might again be expected to decline. A similar model may be hypothesized for *S'f and *Lo, where the probability of moving to an owned home is a function of stage in the life cycle.

In summary, the model may be applied at three different levels of inquiry. At the micro-level the impact of one *S on one *L would be examined. At the meso-level either a series of *S would be examined in conjunction with one *L, or one *S would be examined with a series of *L. On the macro-level a number of *S and *L would be examined in order that a matrix of the inter-relationships of each *S with each *L could be constructed. The identification of significant relationships would be done at the meso-level. By testing the impact of various *S on one *L, those *S which appear to exhibit a significant impact upon *L could be isolated. Assuming that only one *S is of significance, two types of tests could be performed, one at the micro-level and one at the meso-level. At the meso-level the selected *S could be tested as to its impact on various *L to determine if the relationship identified in the first test was significant relative to other *L. At the micro-level the relationship of *S and *L could be tested emperically in order to determine its nature. Upon establishing some relationship of the form $*L = f'(*S)$, the results could be used to fill one cell of the matrix at the macro-level.

This thesis has shown that there exists a relationship between household structure and mobility. The research framework outlined in this chapter may be used to analyse relevant data at a disaggregative level. The aggregative approach has generally proven insufficient for this particular topic of inquiry. A disaggregative approach must be adopted in order to explore further the relationship between household structure and mobility.

BIBLIOGRAPHY

Adams, J. S. "Directional Bias in Intra-Urban Migration," Economic Geography. Vol. 45, 1969, pp. 302-323.

Alberta, Province of "Annual Report of the Department of Public Health including Vital Statistics Division, Province of Alberta 1966," L. S. Wall, Edmonton, Alberta, 1968, 401 pp.

Berardo, F. M. "Widowhood Status in the United States: Perspective on a Neglected Aspect of the Family Life-Cycle," The Family Coordinator. Vol. 17, No. 3, July 1968, pp. 191-203.

__________ "Survivorship and Social Isolation: The Case of the Aged Widower," The Family Coordinator. Vol. 19, No. 1, January 1970, pp. 11-25.

Bourne, L. S. "Apartment Location and the Housing Market," in Bourne (ed), Internal Structure of the City. Oxford University Press, Toronto, 1971, pp. 321-328.

__________ "Land Use Succession in Urban Areas: A Study of Structure and Change," Proceedings of the Association of American Geographers. Vol. 1, 1969, pp. 12-16.

Boyce, R. R. "Residential Mobility and Its Implications for Urban Spatial Change," Proceedings of the Association of American Geographers. Vol. 1, 1969, pp. 22-26.

Brown, L. A., Holmes, J. "Intra-Urban Migrant Lifelines: A Spatial View," Demography. Vol. 8, No. 1, February 1971, pp. 103-122.

__________, Horton, F. E., Wittick, R. I. "On Place Utility and the Normative Allocation of Intra-Urban Migrants," Demography. Vol. 7, No. 2, May 1970, pp. 175-184.

__________, Longbrake, D. B. "Migration Flows in Intra-Urban Space: An Ecological Approach to Place Utility," Departments of Geography, Ohio State University and University of Iowa, 1968, 55 pp., (Xeroxed).

__________, Longbrake, D. B. "Migration Flows in Intra-Urban Space: Place Utility Considerations," Annals of the Association of American Geographers. Vol. 60, No. 2, June 1970, pp. 368-384.

Brown, L. A., Longbrake, D. B. "On the Implementation of Place Utility and Related Concepts: The Intra-Urban Migration Case," in Cox, K. R., Golledge, R. (eds), *Behavioral Studies in Geography: A Symposium*. Northwestern University Studies in Geography, Evanston, Illinois, No. 17, 1969, pp. 169-196.

__________, Moore, E. G. "Intra-Urban Migration: An Actor Oriented Framework," Departments of Geography, University of Iowa and Northwestern University, 1968, 54 pp., (Xeroxed).

__________, Moore, E. G. "The Intra-Urban Migration Process: A Perspective," *Geografiska Annaler*. Series B, Vol. 52B, No. 1, 1970, pp. 1-13.

__________, Moore, E. G. "Perspectives on Urban Spatial Systems," *Economic Geography*. Vol. 47, No. 1, January 1971, pp. 1-90.

Butler, E. W., Sabagh, G., Van Arsdol, M. D. "Demographic and Social Psychological Factors in Residential Mobility," *Sociology and Social Research*. Vol. 48, No. 2, January 1964, pp. 139-154.

Burgess, E. W. "The Growth of the City," in Park, Burgess, MacKenzie (eds), *The City*. University of Chicago Press, Chicago, 1925, pp. 47-62.

Chapin, F. S. jr. "Activity Systems and Urban Structure: A Working Schema," *American Institute of Planners Journal*. Vol. 34, pp. 11-18.

__________ "The Study of Urban Activity Systems," in Chapin, F. S. *Urban Land Use Planning*. University of Illinois Press, Urbana, Illinois, 1965, pp. 221-253.

Chevan, A. "Family Growth, Household Density and Moving," *Demography*. Vol. 8, No. 4, November 1971, pp. 451-458.

Colby, C. C. "Centrifugal and Centripetal Forces in Urban Geography," *Annals of the Association of American Geographers*. Vol. 23, 1933, pp. 1-20.

Duncan, B., Duncan, O. D. "Residential Distribution and Occupational Stratification," *The American Journal of Sociology*. Vol. 60, March 1955, pp. 493-503.

Dick, H. R., Friedsam, H. J., Martin, C. A. "Residential Patterns of Aged Persons Prior to Institutionalization," *Journal of Marriage and the Family*. Vol. 26, No. 1, February 1964, pp. 96-98.

Edmonton, City of. "Civic Enumerations 1956 to 1970," Edmonton, Alberta, March 1971, 11 pp. (mimeoed).

Edmonton Journal. Southam Press, Edmonton, Alberta, January 1966 to June 1966.

Fairbairn, K. "Population Movements Within the Christchurch Urban Area 1959," *New Zealand Geographer*. Vol. 19, 1963, pp. 142-159.

Foote, N. N., *et al Housing Choices and Constraints*. McGraw-Hill, New York, 1960, 453 pp.

Form, W. H. "The Place of Social Structure in the Determination of Land Use: Some Implications for a Theory of Urban Ecology," *Social Forces*. Vol. 32, no. 4, May 1954, pp. 317-323.

Glick, P. C. *American Families*. Census Monograph Series, John Wiley and Sons Inc., New York, 1957, 240 pp.

Golant, S. M. *The Residential Location and Spatial Behavior of the Elderly: A Canadian Example*. The University of Chicago, Departmant of Geography, Research Paper No. 143, University of Chicago Printing Department, Chicago, 1972, 226 pp.

Greer, S. "Urbanism Reconsidered: A Comparative Study of Local Areas in a Metropolis," *American Sociological Review*. Vol. 21, February 1956, pp. 19-25.

Griffin, D. W., Preston, R. E. "A Restatement of the Transition Zone Concept," *Annals of the Association of American Geographers*. Vol. 56, June 1966, pp. 339-350.

Harris, C. D., Ullman, E. L. "The Nature of Cities," *Annals of the American Academy of Political and Social Science*. Vol. CCXLII, November 1945, pp. 7-17.

Hartshorn, T. A. "Inner City Residential Structure and Decline," *Annals of the Association of American Geographers*. Vol. 61, March 1971, pp. 72-96.

Henderson Directories Limited. *Henderson's Greater Edmonton Directory, 1966; 1967; 1968; 1969; 1970; 1971*. Winnipeg, Henderson Directories Limited, 1966 - 1971.

Herbert, J. D., Stevens, B. H. "A Model for the Distribution of Residential Activities in Urban Areas," *Journal of Regional Science*. Vol. 2, 1960, pp. 21-36.

Hill, F. "Migration in the Toronto-Centered (MTARTS) Region," Center for Urban and Community Studies, Research Paper No. 48, University of Toronto, October 1971, 60 pp.

Horton, F. E., Reynolds, D. R. "An Investigation of Individual Action Spaces: A Progress Report," Proceedings of the Association of American Geographers. Vol. 1, 1969, pp. 70-75.

Hoyt, H. The Structure and Growth of Residential Neighborhoods in American Cities. United States Government Printing Office, Washington, D. C., 1939, 189 pp.

Johnston, R. J. "Activity Spaces and Residential Preferences: Some Tests of the Hypothesis of Sectoral Mental Maps," Economic Geography. Vol. 48, No. 2, April 1972, pp. 199-211.

__________ "On Spatial Patterns in the Residential Structure of Cities," The Canadian Geographer. Vol. 14, No. 4, 1970, pp. 361-367.

__________ "Population Movements and Metropolitan Expansion: London 1960 -1961," Institute of British Geographers, Transactions. No. 46, March 1969, pp. 69-91.

__________ Urban Residential Patterns. G. Bell and Sons Limited, London, 1971, 380 pp.

Kaiser, E. J., Weiss, S. F. "Public Policy and the Residential Development Process," American Institute of Planners Journal. Vol. 36, No. 1, January 1970, pp. 30-37.

__________, Weiss, S. F., Burby III, R. J., Donnelly, T. G. Neighborhood Environment and Residential Satisfaction: A Survey of the Occupants and Neighborhoods of 166 Single-Family Homes in Greensboro, North Carolina," Research Previews. Vol. 17, No. 2, November 1970, pp. 11-25.

Kalbach, W. E., McVey, W. W. The Demographic Bases of Canadian Society. McGraw-Hill, Toronto, 1970, 354 pp.

Kenkel, W. F. "The Family Moving Decision Process," in Kenkel, W. F. Family Mobility in Our Dynamic Society. Iowa State University Press, Ames, Iowa, 1965, pp. 178-193.

Lee, E. S. "A Theory of Migration," Demography. Vol. 3, No. 1, 1966, pp. 47-57.

Leslie, G. R., Richardson, A. H. "Life-Cycle, Career Pattern and the Decision to Move," American Sociological Review. Vol. 26 No. 6, December 1961, pp. 894-902.

Long, L. H. "The Influence of Number and Ages of Children on Residential Mobility," Demography. Vol. 9, No. 3, August 1972, pp. 371-382.

Lopata, H. Z. "Lonliness: Forms and Components," Social Problems, Vol. 17, No. 2, Fall 1969, pp. 248-261.

Maisel, S. J. "Rates of Ownership, Mobility, and Purchase," Real Estate Research Program, Essays in Urban Land Economics, University of California, Los Angeles, California, 1966, pp. 93-98.

Marsden, D. "Mothers Alone: Their Way of Life," New Society, Vol. 13, No. 345, May 8, pp. 705-707.

McCann, L. D. "Changing Morphology of Residential Areas in Transition," unpublished Ph. D. dissertation, University of Alberta, Edmonton, Alberta, 1972, 230 pp.

McCracken, K. W. J. "Patterns of Intra-Urban Migration in Edmonton and the Residential Relocation Process," unpublished Ph. D. dissertation, University of Alberta, Edmonton, Alberta, 1973, 213 pp.

McVey, W. W. Edmonton and Calgary: A Demographic Profile, unpublished monograph, University of Alberta, Edmonton, Alberta, 1971, pp. 75-354.

Meyers, G. C., Masnick, G., McGinnis, R. "The Duration of Residence Approach to a Dynamic Stochastic Model of Internal Migration: A Test of the Axiom of Cumulative Inertia," Eugenics Quarterly. Vol. 14, 1967, pp. 121-126.

Michelson, W. "An Empirical Analysis of Urban Environmental Preferences," American Institute of Planners Journal. Vol. 32, No. 6, pp. 355-360.

__________ Man and His Urban Environment: A Sociological Approach, Addison-Wesley Publishing Company, Don Mills, Ontario, 1970, 242 pp.

Moore, E. G. "Models of Migration and the Intra-Urban Case," Australian and New Zealand Journal of Sociology. Vol. 2, No. 1, April 1966, pp. 16-37.

__________ "The Nature of Intra-Urban Migration and Some Relevant Research Strategies," Proceedings of the Association of American Geographers. Vol. 1, 1969, pp. 113-116.

Moore, E. G. "Residential Mobility in the City," Commission on College Geography, Resource Paper No. 13, Association of American Geographers, Washington, D. C., 1972, 50 pp.

Morill, R., Pitts, F. R. "Marriage, Migration and the Mean Information Field: A Study in Uniqueness and Generality," Annals of the Association of American Geographers. Vol. 57, 1967, pp. 401-422.

Mowrer, E. R. "Sequential and Class Variables of the Family in the Suburban Area," Social Forces. Vol. 40, No. 2, December 1961, pp. 107-112.

Murdie, R. A. "The Social Geography of the City: Theoretical and Empirical Background," in Bourne (ed), Internal Structure of the City. Oxford University Press, Toronto, 1971, pp. 279-290.

Muth, R. F. Cities and Housing: The Spatial Pattern of Urban Residential Land Use. University of Chicago, Chicago, 1969, 355 pp.

Nelson, H. J. "The Form and Structure of Cities: Urban Growth Patterns," Journal of Geography. Vol. 68, No. 4, April 1969, pp. 198-207.

Newling, B. E. "The Spatial Variation of Urban Population Densities," Geographical Review. Vol. 59, No. 2, April 1969, pp. 242-252.

Rikkinen, K., Alanen, A. "Migration Trends of Older Aged Persons in Minnesota," Acta Geographica. Vol. 21, Helsinki, 1970, 18 pp.

Rogers, A. "Theories of Intra-Urban Spatial Structure: A Dissenting View," Land Economics. Vol. 43, No. 1, 1967, pp. 108-112.

Roseman, C. C. "Migration as a Spatial and Temporal Process," Annals of the Association of American Geographers. Vol. 61, 1971, pp. 589-598.

Ross, H. L. "Reasons for Moves To and From a Central City Area," Social Forces. Vol 40, No. 3, March 1962, pp. 261-263.

Rossi, P. H. Why Families Move. Glencoe, Free Press, New York, 1955, 220 pp.

Sabagh, G., Van Arsdol, M. D., Butler, E. W. "Some Determinants of Intrametropolitan Residential Mobility: Conceptual Considerations," Social Forces. Vol. 48, No. 1, September 1969, pp. 88-98.

Schnore, L. F. "The City as a Social Organism," *Urban Affairs Quarterly*. Vol. 1, No. 5, March 1966, pp. 58-69.

———, Pinkerton, J. R. "Residential Redistribution of Socioeconomic Strata in Metropolitan Areas," *Demography*. Vol. 3, No. 2, 1968, pp. 491-499.

Sheldon, H. D. *The Older Population of the United States*. Census Monograph Series, John Wiley and Sons, Inc., New York, 1958, 223 pp.

Simmons, J. W. "Changing Residence in the City: A Review of Intra-Urban Mobility," *The Geographical Review*. Vol. 58, 1968, pp. 621-651., reprinted in Berry and Horton (eds), *Geographic Perspectives on Urban Systems*. Prentice-Hall, Inc., New Jersey, 1970, pp. 395-413.

——— "Descriptive Models of Urban Land Use," *Canadian Geographer*. Vol. 9, No. 3, 1965, pp. 170-174.

——— "Net Migration Within Metropolitan Toronto," Center for Urban and Community Studies, Research Paper No. 44, University of Toronto, 1971, 48 pp.

———, Baker, A. M. "Household Movement Patterns," Center for Urban and Community Studies, Research Paper No. 54, University of Toronto, 1972, 55 pp.

Smith, P. J., Bannon, M. J. "The Dimensions of Change in the Central Area of Edmonton, 1946 - 1966," in Sewell and Foster (eds), *The Geographer and Society*. Department of Geography, University of Victoria, Victoria, British Columbia, 1970, pp. 202-219.

Smith, W. F. "Filtering and Neighborhood Change," in Bourne (ed), *Internal Structure of the City*. Oxford University Press, Toronto, 1971, pp. 170-179.

Social Fabric of the Metropolis. Short, J. F. (ed), University of Chicago Press, Chicago, 1971, 320 pp.

Speare, A. "Home Ownership, Life Cycle Stage, and Residential Mobility," *Demography*. Vol. 7, No. 4, November 1970, pp. 449-458.

Stegman, M. A. "Accessibility Models and Residential Location," *American Institute of Planners Journal*. Vol. 35, 1969, pp. 22-29.

Stouffer, S. A. "Intervening Opportunities: A Theory Relating Mobility and Distance," American Sociological Review. Vol. 5, 1940, pp. 845-867.

___________ "Intervening Opportunities and Competing Migrants," Journal of Regional Science. Vol. 2, 1960, pp. 1-26.

Strauss, A. L. "The Latest in Urban Imagery," in Bourne (ed), Internal Structure of the City. Oxford University Press, Toronto, 1971, pp 23-27.

Timms, D. The Urban Mosaic: Towards a Theory of Residential Differentiation. Cambridge University Press, 1971, 277 pp.

Urban Analysis. Page and Seyfried (eds), Scott, Foresman and Co., Glenview, Illinois, 1970, 427 pp.

Vance, J. E. "Housing the Worker: The Employment Linkage as a Force in Urban Structure," Economic Geography. Vol. 42, 1966, pp. 323-325.

Wolpert, J. "Behavioral Aspects of the Decision to Migrate," Papers of the Regional Science Association. Vol. 15, 1965, pp. 159-169.

___________ "Migration as as Adjustment to Environmental Stress," Journal of Social Issues. Vol. 22, 1966, pp. 92-102.

APPENDIX 1

ANALYSIS OF QUESTIONNAIRE HOUSEHOLDS - CHILD-BEARING

KEY

H	high-rise apartment
W	walk-up apartment
M	multiple-family dwelling
S	single-family dwelling
O	owned dwelling
R	rented dwelling

TYPE OF DWELLING AT ORIGIN AND DESTINATION FOR FIRST MOVE

	Destination			
Origin	S	M	W	H
S	20	4	0	0
M	6	1	1	0
W	4	0	1	0
H	0	0	0	1

TENURE AT ORIGIN AND DESTINATION FOR FIRST MOVE

	Destination	
Origin	O	R
O	11	0
R	20	7

Source: Questionnaire Survey, 1973.

APPENDIX 1

ANALYSIS OF QUESTIONNAIRE
HOUSEHOLDS - CHILD-BEARING

SIZE OF DWELLING AT DESTINATION RELATIVE TO ORIGIN FOR FIRST MOVE

Larger than	32
Smaller than	3
Same size as	2
Not stated	1

YEAR OF FIRST MOVE

1966	7
1967	17
1968	9
1969	4
1970	0
Not stated	1

REASONS FOR MOVE

Increased family size	9
Needed more space	11
Wanted home ownership	11
Economic reasons	2
Involuntary move	5

Source: Questionnaire Survey, 1973.

APPENDIX 1

QUESTIONNAIRE SCHEDULE

Department of Geography
University of Alberta

HOUSING AND MOBILITY STUDY (1973)

I am a graduate student in the Department of Geography at the University of Alberta. At present I am doing a study concerned with housing in Edmonton and why people move in our city. If you have made one or more moves within the city since 1966 I would greatly appreciate it if you could fill out the other side of this questionnaire and mail it to me in the stamped self-addressed envelope, at your earliest convenience.

I hope that my study will be of use in planning policy, for homebuilders, and for the general public. In order to succeed I need your cooperation and will be very greatful if you help me out by filling in this questionnaire.

If you have any questions about this questionnaire or about my study I will be only too glad to answer them. My phone at the University is 432-5624 and at home 452-5206.

Thank you very much for your attention and I hope that you will take five minutes of your time to help me in my studies.

Yours very truly,

Oleh Lukomskyj

APPENDIX 1
QUESTIONNAIRE SCHEDULE

PLEASE USE THE FOLLOWING ABBREVIATIONS FOR TYPE OF DWELLING:

H	high-rise apartment
W	walk-up apartment
M	multiple-family (duplex, for example)
S	single family home

FOR TENURE

O	owned
R	rented

REASONS FOR MOVE

January 1966
TYPE OF DWELLING
TENURE

First move
Date
TYPE OF DWELLING
TENURE
Larger than
Smaller than
Same size as
Previous Dwelling

Second move
Date
TYPE OF DWELLING
TENURE
Larger than
Smaller than
Same size as
Previous Dwelling

Third move
Date
TYPE OF DWELLING
TENURE
Larger than
Smaller than
Same size as
Previous Dwelling

Fourth move
Date
TYPE OF DWELLING
TENURE
Larger than
Smaller than
Same size as
Previous Dwelling